

**APPENDIX 2: Waterbodies Assessment Report  
(119 pages)**

# Ernestown Wind Park

## *Water Assessment Report* DRAFT

Prepared by: *M.K. Ince and Associates Ltd.*

Prepared for: *Ernestown Wind Park Inc.*

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*M.K. INCE AND ASSOCIATES LTD.*  
*Renewable Energy & Environmental Consulting*

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# 1 INTRODUCTION

The Ernestown Wind Park *Water Assessment Report* has been prepared in accordance with Sections 29 to 31 of *Ontario Regulation 359/09*, under the *Environmental Protection Act*, referred to in this report as the Renewable Energy Approval or REA rules. This *Water Assessment Report* documents the findings from the Records Review and Site Investigation carried out at the proposed location of the Ernestown Wind Park for the purpose of identifying water bodies in the vicinity of the anticipated wind park project.

The Ministry of Environment (MOE) REA checklist for completion of the *Water Assessment Report* summarizes the regulation requirements for this report and demonstrates how those requirements have been met. This checklist has been included as **Table 1-1**: below.

**Table 1-1: MOE REA Checklist for the Water Assessment Report**

<b>Water Assessment</b>		
<b>REQUIRED DOCUMENTATION</b>	<b>REQUIRE- MENT MET</b>	<b>LOCATION IN SUBMISSION</b>
Search for and analysis of the records set out in Column 1 of the Table to section 30 was conducted in respect of the project location for the purpose of making the determinations set out opposite the records in Column 2 of the Table;		
Report was prepared setting out a summary of the records searched and the results of the analysis conducted above	Yes	<b>Section 3</b>
1. A physical investigation of the land and water located within 120 metres of the project location was conducted for the purpose of determining, (a) whether the results of the analysis summarized in the “Records Review” report are correct or require correction, and identifying any required corrections;	Yes	<b>Section 4</b>
(b) whether any additional water bodies exist, other than those identified in the Records Review;	Yes	<b>Section 4.2, Section 4.3</b>
(c) the boundaries, located within 120 metres of the project location, of any water body that was identified in the Records Review or the Site Investigation; and	Yes	<b>Section 4.2, Section 4.3, Figure 3-1, Figure 4-15</b>
(d) the distance from the project location to the boundaries determined under clause (c).	Yes	<b>Figure 3-1, Table 4-2 and Figure 3-1</b>
2. If, as a result of the Records Review, the average annual high water mark of a lake trout lake that is at or above development capacity, was identified within 300 metres of the project location, a physical investigation of the land and water located within 300 metres of the project location was conducted for the purpose of determining, (a) whether the results of the analysis summarized in the “Records Review” report are correct or require correction, and identifying any required corrections;	N/A	<b>N/A</b>
(b) whether any additional water bodies exist, other than those that were identified in the “Records Review” report;	N/A	<b>N/A</b>

(c) the boundaries of any lake trout lake that is at or above development capacity, if, (i) the lake was identified in the Records Review or the Site Investigation, and (ii) the boundaries are within 300 metres of the project location;	N/A	N/A
(d) the boundaries of any water body other than a lake trout lake that is at or above development capacity, if, (i) the water body was identified in the Records Review or the Site Investigation, and (ii) the boundaries are within 120 metres of the project location; and	N/A	N/A
(e) the distance from the project location to the boundaries determined under clause (c) and (d).	N/A	N/A
3. A report was prepared that sets out the following, (a) A summary of any corrections to the “Records Review” report and the determinations made as a result of conducting the Site Investigation.	Yes	<b>Section 3.2, Section 4 and Section 5</b>
(b) Information relating to each water body identified in the Records Review and in the Site Investigation, including the type of water body, plant and animal composition and the ecosystem of the land and water investigated.	Yes	<b>Section 3 and Section 4.2</b>
(c) A map showing, i. the boundaries mentioned in clause (1) (c) or (2) (c) and (d),	Yes	<b>Figure 3-1 and Figure 4-15</b>
ii. the location and type of each water body identified in relation to the project location, and	Yes	<b>Figure 3-1 and Figure 4-15</b>
iii. the distances mentioned in clause (1) (d) or (2) (e).	Yes	<b>Figure 4-15</b>
(d) The dates and times of the beginning and completion of the Site Investigation.	Yes	<b>Table 4-1</b>
(e) The duration of the Site Investigation.	Yes	<b>Table 4-1</b>
(f) The weather conditions during the Site Investigation.	Yes	<b>Section 4.1.2 and Table 4-1</b>
(g) A summary of methods used to make observations for the purposes of the Site Investigation.	Yes	<b>Section 4.1</b>
(h) The name and qualifications of any person conducting the Site Investigation.	Yes	<b>Section 4.1 and Appendix B</b>
(i) Field notes kept by the person conducting the Site Investigation.	Yes	<b>Appendix C</b>

Additional background on the proposed Ernestown Wind Park project may be found in the accompanying *Natural Heritage Records Review Report*. **Figure 2-1** indicates the project location within Ontario and the proposed layout of all infrastructure for the project. Unique water body ID’s given to each water body identified in Records Review can also be seen in **Figure 3-1**.

## 2 PROJECT LOCATION

Ernestown Wind Park Inc. proposes to build a wind park, with a nameplate capacity of 10 MW for privately-owned agricultural lands within Loyalist Township, Lennox-Addington County, Ontario (see **Figure 2-1**). The project will be known as the Ernestown Wind Park and would consist of five (5) wind electric generators and would be rated as a Class 4 wind energy facility. The proponent has received a contract from the Ontario Power Authority for the purchase of electricity generated by the wind turbines at this renewable facility through the Province's Feed-In-Tariff Program. The project is subject to the Renewable Energy Approval (REA) process per *Ontario Regulation 359/09* under Section V.0.1 of the *Environmental Protection Act*.

The site is 1.2 km north of Lake Ontario, west of the city of Kingston and bordered by Millhaven Road to the north and Taylor-Kidd Boulevard to the south.

In the case of the Ernestown Wind Park, the Project Location is an area or volume encompassing all of the following:

- Concrete foundations
- Gravel access roads
- Graveled laydown areas, crane assembly area and crane pads
- Collector system
- Aboveground electrical lines
- Substation
- Belowground communication lines
- Widening of private entrance off Millhaven Road

The facility is proposed on privately-owned lands near the community of Ernestown, in the Township of Loyalist, Lennox-Addington County, Ontario.

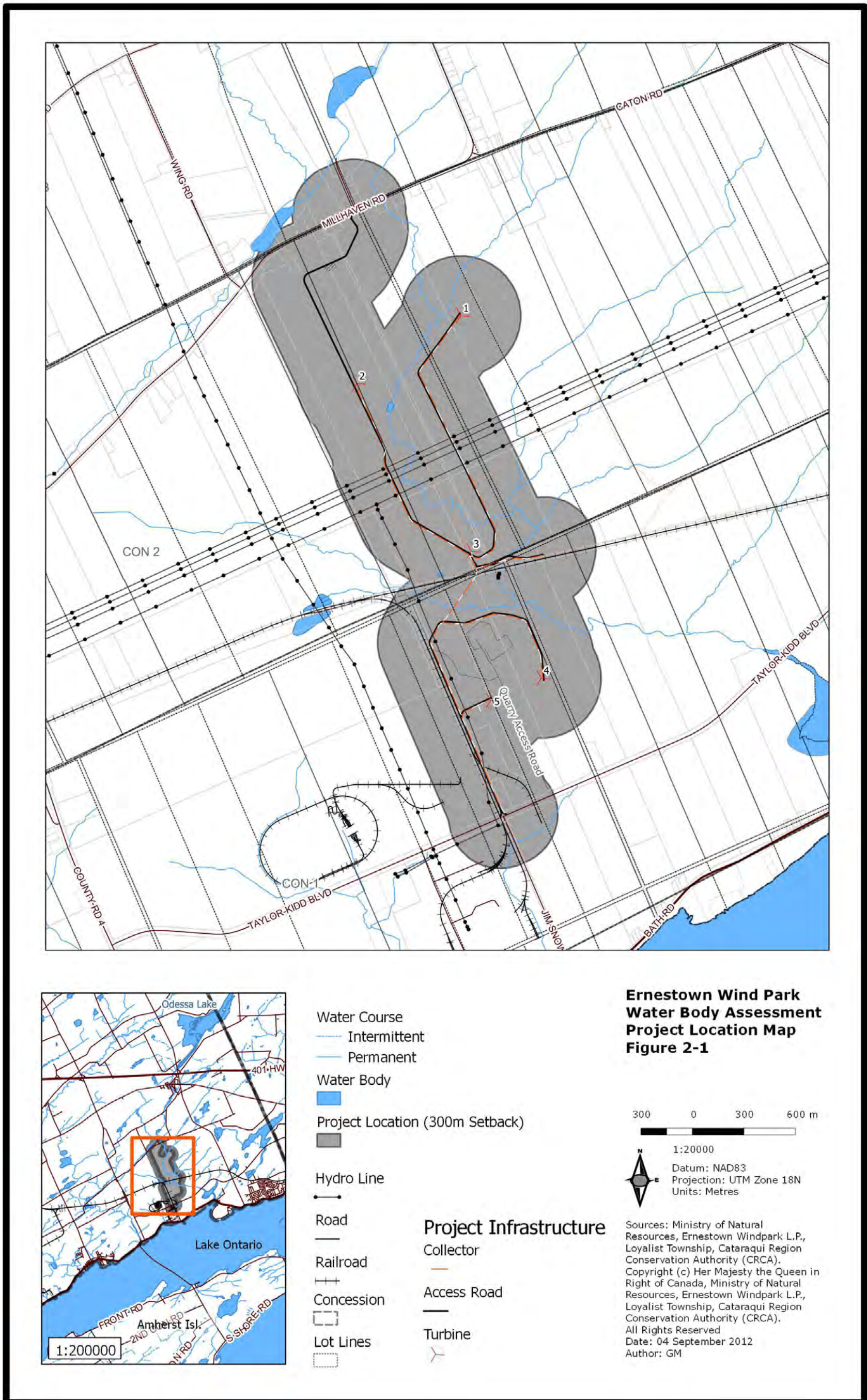


Figure 2-1: Project Location and proposed project layout for the proposed Ernestown Wind Park



### 3 RECORDS REVIEW

As specified in the REA rules, a Records Review was undertaken to identify water bodies within REA-specified distances of proposed infrastructure associated with the Ernestown Wind Park. Assessment of water bodies within the following distances from the proposed Project Location is mandated in the REA rules:

- Within 120 metres of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity.
- Within 300 metres of the average annual high water mark of a lake trout lake that is at or above development capacity.
- Within 120 metres of the average annual high water mark of a permanent or intermittent stream.
- Within 120 meters of a seepage area.

For the purposes of the Ernestown Wind Park area, records provided by the following agencies and parties were reviewed, as specified in Section 30 of the REA rules:

- Cataraqui Region Conservation Authority (CRCA) provided information on water bodies as well as the CRCA's mandate regarding conservation, restoration, development, and responsible management of land, water and natural habitats. Source: <http://www.cataraqueiregion.on.ca/>. Additionally, Tom Beaubiah was contacted directly by email for further information (see **Section 3.1.1**). Please see **Appendix A** for correspondence records.
- Aquatic Species at Risk information on the Conservation Ontario site was consulted for the Cataraqui region. Source: <http://conservation-ontario.on.ca/projects/DFO.html> No aquatic Species at Risk were identified in the region.
- Ministry of Environment (MOE). Direct contact was made with Sandra Guido by email (May 31, 2012). No response has been received and no pertinent information obtained.
- The Ministry of Natural Resources (MNR), Land Information Ontario (LIO) website was used for geographic information for use in maps and Geographic Information Systems (GIS). Source: <http://lioapp.lrc.gov.on.ca/edwin/edwin.asp> (**Section 3.1.2**)
- Direct consultation occurred with the MNR including Eric Prevost, Renewable Planning Ecologist at the Peterborough District Office. This consultation was conducted in order to obtain information pertaining to water bodies as well as fisheries data (see **Section 3.1.3**). Please see **Appendix A** for correspondence records.
- Natural Heritage Information Centre (NHIC), Ontario: The NHIC website, established by the OMNR, lists and describes natural features as well as their locations in the vicinity of the project area (see **Section 3.1.4**). Source: [http://nhic.mnr.gov.on.ca/MNR/nhic/nhic\\_old.cfm](http://nhic.mnr.gov.on.ca/MNR/nhic/nhic_old.cfm)
- Satellite imagery from Google Earth was extensively used to identify vegetation types, roads, wetlands, stream, lakes, and general topography (**Section 3.1.5**).
- Loyalist Township (Murray Beckel- Director of Planning and Development Services and Jim Sova) was contacted by email (May 31, 2012). No response has been received and no pertinent information obtained.

- The Lennox-Addington County website was examined to obtain relevant information pertaining to land-use, water bodies and any other relevant information. Source: [www.lennox-addington.on.ca](http://www.lennox-addington.on.ca). Lennox-Addington County was also contacted directly by telephone for further information; inquiries were directed from Lennox-Addington County to Loyalist Township.
- Direct consultation with participating landowners (see **Section 3.1.6**).

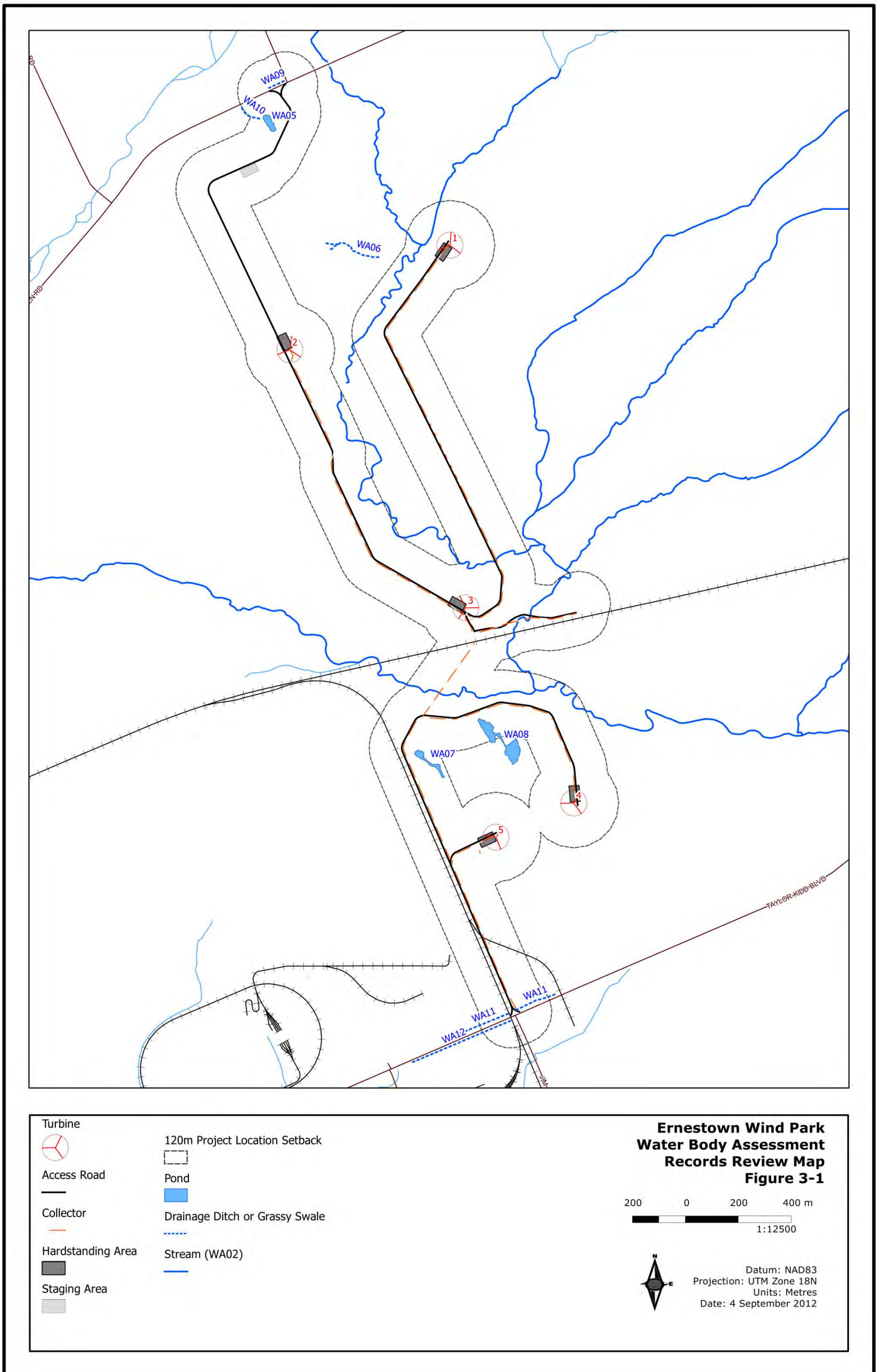


Figure 3-1: Ernestown Wind Park Water Bodies Assessment Records Review Map

## 3.1 Records Review Search Results

The following sources consulted during the Records Review provided pertinent information regarding the geographic locations of water bodies relative to the project location. Information on plant and animal composition was also received and included in the sections below.

### 3.1.1 Conservation Authorities

The project area is located in the watershed managed by the Cataraqui Region Conservation Authority (CRCA). The Conservation Authority was consulted online (May 31, 2012) as well as directly by email. ([www.cataraqueiregion.on.ca](http://www.cataraqueiregion.on.ca))

Cataraqui Region Conservation Authority (CRCA) provided information on the conservation authority area as well as the CRCA's mandate regarding conservation, restoration, development and responsible management of land, water and natural habitats. CRCA also regulates any ravines, valleys, watercourses, steep slopes and floodplains. There are no regulated areas within 120 m of the project location. The Project Location is west of Parrott's Bay Conservation Area (email correspondence with the CRCA dated June 5, 2012; **Appendix A**).

### 3.1.2 LIO

A search of the LIO website (May 31, 2012) found one stream (WA02) within the project location. The location of this water body will be confirmed during Site Investigations.

### 3.1.3 MNR Consultation

Initial information relating to water bodies was obtained from Eric Prevost, Renewable Energy Planning Ecologist, Peterborough District MNR Office on June 4, 2012 (see **Appendix A**). Correspondence indicated that information regarding water bodies in the project area could be obtained through various websites. All websites that provided pertinent information pertaining to the identification of water bodies and associated flora and fauna is included within **Section 3.1**.

### 3.1.4 NHIC

The NHIC database search was completed May 31, 2012 for NTS 1 km Mapsheets 18UP69\_26-29, 38-39 and 18UQ60\_20 and 30 for S1 to S3 rank and Special Concern species. An extended search (Mapsheets 18UQ60\_21, 31, 32, 40,41, 42, 43, 59 and 18UP69\_18 and 08) to include entire water body features in the vicinity of the Ernestown Wind Park found one species associated with water bodies:

- A moss (*Grimmia olneyi*)- Grows in cracks and exposed faces of dry to periodically wet, acidic or calcareous rocks, commonly along streams or splash zones of lake shores.

This moss will be searched for during the Site Investigation.

### 3.1.5 Google Earth Aerial Imagery

Satellite imagery from Google Earth was extensively used to identify potential water bodies in the vicinity of the wind park site (May 31, 2012). Use of this source identified nine (WA02-WA12) water bodies within the Project Location. Water bodies WA02 has a number of reaches within 120 m of the Project Location and will be crossed three times at locations along different stream reaches (WA02A, WA02B, WA02C) (See **Figure 3-1**). These potential water bodies will be explored during Site Investigations.

### 3.1.6 Consultation with Land Owner

Consultation with a land owner identified that one dugout pond (WA05) exists on participating property. This artificial pond is surrounded by cattails, grasses and pondweed.

## 3.2 Summary of Findings from the Records Review

Based on the Records Review, water bodies within 120 m of the Ernestown Wind Park include the following:

- a) One stream (WA02) observed in aerial imagery and LIO to be crossed at three locations by access roads and overhead collector lines
- b) One artificial pond (WA05)
- c) Two grassy swales (WA06 and WA10)
- d) One natural pond (WA07)
- e) One pond (WA08) within a quarry
- f) Three drainage ditches (WA09, WA11 and WA12) next to the artificial pond along the north side of Millhaven Rd., as well as the north and south side of Taylor-Kidd Rd.

All water bodies will be surveyed during the Site Investigation. WA05 will be assessed to confirm that this pond is artificial and consequently not included as a “water body” according to *Ontario Regulation 359/09*. The boundaries of all sections of the stream within 120 m of the Project Location will be confirmed during Site Investigation. Similarly, the composition and boundary of WA06 will also be confirmed during Site Investigation to evaluate the type of water body. A survey of the pond in the quarry will be taken to confirm its artificiality. The drainage ditches will also be surveyed to evaluate presence and type of water body.

No seepage areas or lake trout lakes were found to occur within 120 m and 300 m of the Project Location. This will be confirmed during the Site Investigation

## 4 SITE INVESTIGATION

Nine potential “water bodies” identified during the Records Review were carried forward to the Site Investigation. The presence, location and boundaries of the water bodies were confirmed during Site Investigation.

In addition to surveys to investigate the potential water bodies identified during the Records Review above, the Site Investigation was also intended to identify any additional water bodies.

### 4.1 Methods

Subsequent to the Records Review, a Site Investigation was carried out with reference to Section 31 of the REA rules for the purpose of confirming and supplementing the findings of the Records Review. Water bodies were confirmed on-site and the surrounding area within 120 m of all proposed project location was searched for additional water bodies not identified in the Records Review. The presence, location and boundaries of each feature were confirmed during site visits. All features identified during Records Review and new features identified during Site Investigation were delineated in field to determine feature size and shape. During the Site Investigation all water bodies were considered as potential fish habitat until determined otherwise.

#### 4.1.1 Site Investigation Personnel

Site Investigations were carried out by M.K. Ince biologists David Jolly and Dan Stuart. Their Curricula Vitae can be found in **Appendix B**.

#### 4.1.2 Dates, Times & Weather

Seven site visits were carried out to confirm the presence, location and boundary of water bodies identified in the Records Review and with the intention of documenting the following for any water bodies within the Project Location: type of water body; plant and animal composition; ecosystem of the land and water. SV1 and SV2 were conducted May 1, 2012 and May 31, 2012 respectively, for the purpose of identifying any intermittent streams and to note high-water mark of water bodies found within 120 m of the Project Location. SV3 to SV6 were conducted June 1 and June 7-9, 2012 to perform water body assessments and search for additional water bodies. A final site visit (SV7) was conducted August 16, 2012 to collect additional data on water bodies. Each site visit is detailed below in **Table 4-1**, including relevant weather conditions. Particulars of the field observations can be found in the Field Notes included in **Appendix C**.

**Table 4-1: Site Investigation Details**

<b>Site Visit Number</b>	<b>Personnel</b>	<b>Date(s)</b>	<b>Start/End Time</b>	<b>Duration</b>	<b>Purpose</b>	<b>Weather Conditions (Observed)</b>
SV1	Dave Jolly	2012/05/01	12:23-17:20	5 h	Identify the presence and location of water bodies identified in Records Review.	Temp.:16°C; no rain; Wind: 0; CC: 10/10
SV2	Dave Jolly	2012/05/31	15:45-20:32	4.75 h	Confirm the presence, location and boundary of water bodies identified in Records Review.	Temp.: 22°C; Wind: 2 ; CC: 8/10; Sunny
SV3	Dave Jolly	2012/06/01	8:15-15:45	7.5 h	Perform water body assessments on known water bodies and search for new water bodies.	Temp.: 11°C; Wind 2 ; CC 10/10; Overcast with 10-20 mm of rain
SV4	Dave Jolly	2012/06/07	12:45-20:45	8 h	Confirm the type of water body identified during SV1, SV2 and SV3.	Temp.: 18°C; sunny, no rain; Wind 3; CC:2/10-10/10
SV5	Dave Jolly	2012/06/08	7:45-19:15	11.5 h	Perform water body assessments.	Temp.: 16°C; no rain; Wind:1; CC:7/10
SV6	Dave Jolly	2012/06/09	9:30-21:30	12 h	Perform water body assessments.	Temp.: 18°C; no rain; Wind:1; CC:10/10
SV7	Dan Stuart	2012/08/16	10:30-2:30	4 h	Perform water body assessments.	Temp.: 29°C, clear; Wind:1, CC:10%

## 4.2 Results from Site Investigation

A total of nine water bodies identified during the Records Review were surveyed during the Site Investigation. Additionally, three other water bodies, not previously identified, were located and surveyed during the Site Investigation. Details on all water bodies surveyed can be seen below.

### 4.2.1 WA02

WA02 was identified during the Records Review from aerial imagery and LIO. This water body is a permanent stream in most reaches and crosses the Project Location three times (**Figure 3-1**). WA02 crosses agricultural fields, wetlands and woodlands eventually draining into Parrott's Bay Conservation Area which is approximately 900 m outside the Project Location. In general, the width of the stream is an estimated 3-10 m at high flow with a pool depth of 20-30 cm at high flow. Water temperature ranged from 15.5-16.1°C with a pH of 7.4-7.8. The stream was noted as suitable fish habitat and fish were observed in the water body. Northern leopard frog was also observed, as well as tadpoles and a dead common snapping turtle

WA02 is crossed by access roads and overhead electrical cabling and is therefore 0 m from the Project Location. The Site Investigation determined that the stream will be crossed at three locations. Additional information on these stream crossings can be seen below and in **Appendix D**.

This water body is carried forward to the *Water Bodies Impact Assessment Report*.

#### 4.2.1.1 Crossing WA02A

At crossing location WA02A the stream will be crossed by access road infrastructure and an overhead collector line. The stream substrate is 70% muck, 20% cobble and 10% bedrock. The stream width at high flow is approximately 10 m with a maximum pool depth of 20 cm. On June 1, 2012, at the crossing location, the water body was 1 m wide and 10 cm deep. The adjacent land use includes red cedar forest, deciduous forest and agricultural land use.





**Figure 4-1:**WA02A Crossing location

#### **4.2.1.2** *Crossing WA02B*

At crossing location WA02B the stream is intermittent and will be crossed by access road infrastructure and an overhead collector line. The stream substrate is 95% bedrock and 5% cobble. The stream width at high flow is approximately 5 m with a maximum pool depth of 30 cm. On June 1, 2012, at the crossing location, the water body was 1 m wide and 0 cm deep. Riparian vegetation includes elecampane, white ash, red cedar and prickly ash. The adjacent land use includes red cedar forest and CN railway tracks.



**Figure 4-2:** WA02B Crossing location

#### **4.2.1.3** *Crossing WA02C*

At crossing location WA02C the stream will be crossed by an overhead collector line only. The stream substrate is 40% gravel, 30% sand, 20% boulder and 10% silt. The stream width at high flow is approximately 3 m with a maximum pool depth of 30 cm. On May 31, 2012, at the crossing location, the water body was 1 m wide and 10 cm deep. Riparian vegetation includes nanny berry, downy arrowwood, fowl nannagrass, fragrant bedstraw and purple loosestrife. The adjacent land use includes red cedar forest and CN railway tracks.



**Figure 4-3:** WA02C Crossing location

#### **4.2.2 WA05**

WA05 was identified during the Records Review and confirmed as an artificial, dugout pond more than 30 years old. This history was noted in a conversation with the landowner during SV2. Given that this potential water body is artificial, it is not considered a “water body” in O. Reg. 359/09 and therefore is not carried forward to the *Water Bodies Impact Assessment Report*.



**Figure 4-4:** WA05 Artificial, dugout pond

### 4.2.3 WA06

WA06 was identified during the Records Review and the boundaries of this feature were confirmed during SV3 (**Figure 4-5**). Aerial photography indicated a grassy swale crossing an agricultural field of row crops. During the site visit it was determined that there is no water body present; there was no indication of stream channelization and the entire area is grassed (dominated by graminoids). This feature is not considered a “water body” in O. Reg. 359/09 and therefore is not carried forward to the *Water Bodies Impact Assessment Report*.



**Figure 4-5:** WA06 Grassy swale

#### 4.2.4 WA07

WA07 was identified during the Records Review and confirmed as a shallow marsh (ELC code: MAS2-1) during SV2. This feature is located 24 m from access road infrastructure and an overhead collector line. The substrate is 100% clay with riparian vegetation dominated by narrow leaved cattail, common cattail, reed canary grass, purple loosestrife, Canada rush, Bebb's sedge and awl-fruited sedge. Adjacent land use includes woodland, CN railway tracks and industry. The pH of this pond is 8.4 with a temperature of 20.4°C. This feature was not identified as suitable as fish habitat. Additional information on this water body can be seen in **Appendix D**. This feature is carried forward to the *Water Bodies Impact Assessment Report*.



**Figure 4-6:** WA07 Shallow marsh/pond

#### **4.2.5 WA08**

WA08 was identified during the Records Review and confirmed as an artificial pond within a quarry area during SV2. Given that this potential water body is both artificial and beyond the REA mandated buffer, it is not carried forward to the *Water Bodies Impact Assessment Report*.



**Figure 4-7:** WA08 Aggregate quarry

#### **4.2.6 WA10**

WA10 was identified during the Records Review as a grassy swale and the boundaries of this feature were confirmed during SV4 (**Figure 4-7**). During the site visit it was determined that there is no water body present; there was no indication of stream channelization and the entire area is grassed (dominated by graminoids). This feature is not considered a “water body” in O. Reg. 359/09 and therefore is not carried forward to the *Water Bodies Impact Assessment Report*.



**Figure 4-8:** WA10 Grassy swale

#### **4.2.7 Drainage Ditches – WA09, WA11, WA12**

Drainage ditches were surveyed during the Site Investigation. The drainage ditches surveyed include: WA09 located on the north side of Millhaven Road (**Figure 4-9**); WA11 located on the north side of Taylor-Kidd Road (**Figure 4-10**); and WA12 located on the south side of Taylor-Kidd Road (**Figure 4-11**). The ditches act as temporary channels for surface drainage, and are not permanent or intermittent streams. There were no fish species identified or suitable fish habitat observed. No species of conservation concern were identified during surveys. These features are not considered “water bodies” in O. Reg. 359/09 and therefore are not carried forward to the *Water Bodies Impact Assessment Report*.





**Figure 4-9:** WA09 Roadside drainage ditch on north side of Millhaven Rd.



**Figure 4-10:** WA11 Drainage ditch along north side of Taylor-Kidd Road



**Figure 4-11:** WA12 Drainage ditch along south side of Taylor-Kidd Road

#### **4.2.8 WA13**

WA13 was identified and surveyed during SV7 and determined to be a natural pond (**Figure 4-12**). This feature is located 102 m from access road infrastructure and an overhead collector line. The substrate of this pond is 50% sand and 50% silt. Riparian vegetation includes green ash, prickly ash, milkweed, American elm and various upland species. Adjacent land use includes soy fields to the north and deciduous forest in all other directions. The pH of this pond is 8.0 with a temperature of 25°C. The pond is stagnant with heavy eutrophication noted. No amphibians were heard or seen, and the pond is not suitable fish habitat. Additional information on this water body can be seen in **Appendix D**. Given that this potential water bodies is natural, it are carried forward to the *Water Bodies Impact Assessment Report*.



**Figure 4-12:**WA13 Open Aquatic natural pond

#### 4.2.9 WA14

WA14 was a spring identified during SV4 and surveyed again during SI7. This feature is located 31 m from access road infrastructure and an overhead collector line. It is an intermittent spring emerging from beneath limestone layers under a tree. A channel of approximately 2 metres has been formed by flow of the spring before it empties into the permanent stream (WA02C). Some wetland vegetation is present in the channel and riparian vegetation includes arrowhead, bugleweed, puckweed, water plantain and jewelweed. The spring was dry when surveyed August 16, 2012. Additional information on this water body can be seen in **Appendix D**. Given that this potential water bodies is spring, it is carried forward to the *Water Bodies Impact Assessment Report*.



**Figure 4-13:** WA14 Spring

#### **4.2.10 WA15**

WA15 was a spring identified and surveyed during SI7 (**Figure 4-14**). This feature is located 51 m from access road infrastructure and an overhead collector line. It is an intermittent spring emerging from beneath limestone layers. A channel of approximately 3 metres width has been formed by the spring before it empties into a wetland (WE05-6). There are large boulders and some wetland vegetation present in the channel. The spring was dry surveyed on August 16, 2012. Additional information on this water body can be seen in **Appendix D**. This water body is carried forward to the *Water Bodies Impact Assessment Report*.



**Figure 4-14:** WA15 Spring

### **4.3 Summary of Site Investigation**

A summary of all potential water bodies surveyed during the Site Investigation can be seen in **Table 4-2** below. These potential water bodies were identified either in the Records Review via various sources for consultation (WA02, WA05-12), or during the Site Investigation (WA13, WA14, WA15).

In conclusion, twelve potential water bodies were identified in the vicinity of the Ernestown Wind Park Project location. Seven of the twelve features were discounted as water bodies. Consequently, only five water bodies (WA02, WA07, WA13, WA14 and WA15) are carried forward to the *Water Bodies Impact Assessment Report*. Water bodies carried forward to the *Water Bodies Impact Assessment Report* are presented below in **Figure 4-15**.

**Table 4-2:** Summary of Water Bodies in proposed Ernestown Wind Park

<b>Water Body ID</b>	<b>Outcome of Records Review</b>	<b>Outcome of Site Investigation</b>	<b>Qualifies as Water Body</b>	<b>Carried forward to Water Bodies Impact Assessment Report</b>
<b>WA02</b>	Identified in aerial imagery & LIO	Stream – crossed at three locations	<b>Yes</b>	<b>Yes</b>
<b>WA05</b>	Identified in aerial imagery	Artificial pond	No	No
<b>WA06</b>	Identified in aerial imagery	Grassed waterway	No	No
<b>WA07</b>	Identified in aerial imagery	Shallow marsh/pond – located 34 m from Project Location	<b>Yes</b>	<b>Yes</b>
<b>WA08</b>	Identified in aerial imagery	Artificial pond in quarry	No	No
<b>WA09</b>	Identified in aerial imagery	Drainage ditch on North side of Millhaven Rd.	No	No
<b>WA10</b>	Identified in aerial imagery	Grassed waterway	No	No
<b>WA11</b>	Identified in aerial imagery	Drainage ditch on North side of Taylor-Kidd Rd.	No	No
<b>WA12</b>	Identified in aerial imagery	Drainage ditch on South side of Taylor-Kidd Rd.	No	No
<b>WA13</b>	Identified at Site Investigation	Natural pond - located 102 m from Project Location	<b>Yes</b>	<b>Yes</b>
<b>WA14</b>	Identified at Site Investigation	Spring – located 31 m from Project Location	<b>Yes</b>	<b>Yes</b>
<b>WA15</b>	Identified at Site Investigation	Spring – located 51 m from Project Location	<b>Yes</b>	<b>Yes</b>

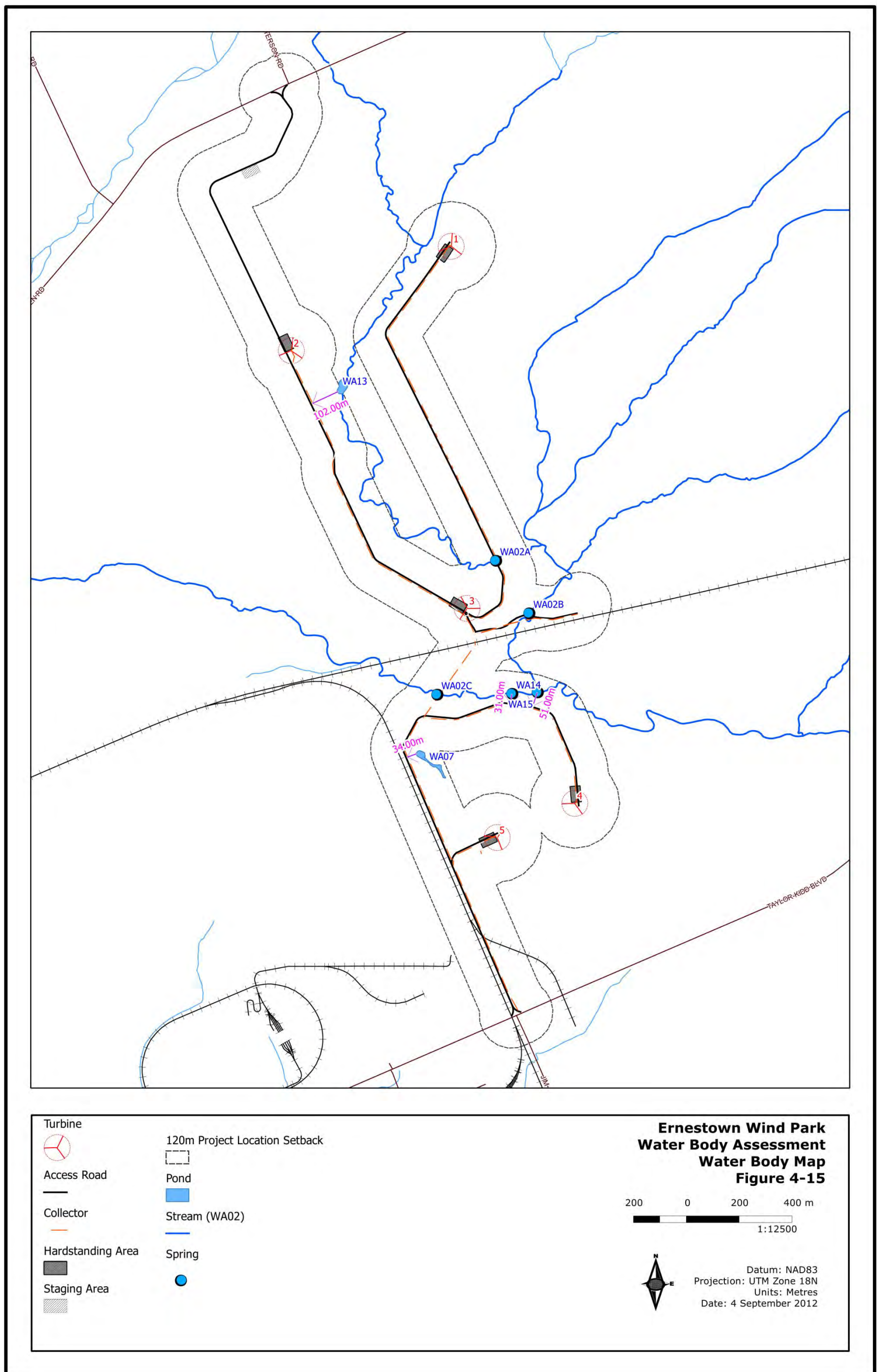


Figure 4-15: Ernestown Wind Park Water Body Assessment Map



## 5 CONCLUSIONS

The Ernestown Wind Park *Water Assessment Report* summarizes the findings of a Records Review and subsequent Site Investigation. Results of this assessment indicate that five water bodies exist within 120 m from the proposed Project Location (WA02, WA07, WA13, WA14 and WA15). WA02 will be crossed at three locations by access roads and overhead collector lines.

A *Water Bodies Impact Assessment Report* has been prepared to evaluate impacts of the project on these water bodies, as required in Section 39 and 40 of the REA regulation. The *Water Bodies Impact Assessment Report* is intended to provide details regarding the potential negative impacts on confirmed water bodies and proposed measures to mitigate such impacts.

## **6 QUALIFICATIONS AND LIMITATIONS**

M.K. Ince and Associates Ltd. (MKI) have prepared this report in accordance with information provided by its Client. The information and analysis contained herein is for the sole benefit of the Client and save for regulatory review purposes may not be relied upon by any other person.

The contents of this report are based upon our understanding of information and reports prepared by others, including Horizon and their consultants. While we may have referred to and made use of this information and reporting, we assume no liability for the accuracy of this information.

MKI's assessment was made in accordance with guidelines, regulations and procedures believed to be current at this time. Changes in guidelines, regulations and enforcement policies can occur at any time and such changes could affect the conclusions and recommendations of this report.

## 7 REFERENCES

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[http://www.efloras.org/florataxon.aspx?flora\\_id=1&taxon\\_id=242443420](http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242443420) [accessed August 13, 2012]
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- Ontario Ministry of Natural Resources. 1989. *Lake Trout Lakes in Ontario*.
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## APPENDIX A – AGENCY CORRESPONDENCE



**CATARAQUI REGION CONSERVATION AUTHORITY**

1641 Perth Road, P.O. Box 160 Glenburnie, Ontario K0H 1S0

Phone: (613) 546-4228 Fax: (613) 547-6474

E-mail: [crca@cataraquiregion.on.ca](mailto:crca@cataraquiregion.on.ca) Website: [www.cataraquiregion.on.ca](http://www.cataraquiregion.on.ca)

---

June 10, 2010

File: GC-LOY

**Sent by Email ([Lmisch@aet-consultants.com](mailto:Lmisch@aet-consultants.com))**

Les Misch  
Principal & Senior Ecologist  
AET Consultants  
531 Wellington Street North  
Kitchener, ON N2H 5L6

Dear Mr. Misch:

**Re: Property Inquiry (Proposed Wind Power Project)  
Lots 25-26, Concession 1 and Lots 25-28, Concession 2, Ernestown  
South of Millhaven Road, Loyalist Township  
Unnamed Watercourses and Significant Woodlands**

Cataraqui Region Conservation Authority (CRCA) staff are writing regarding your request for information for the above-noted properties located south of Millhaven Road in Loyalist Township and for the area within 120 m of the subject properties. The site was not visited.

The subject lands are bound by Millhaven Street to the north and Taylor-Kidd Boulevard to the south. Aerial photography of the area indicates that a major portion of the subject lands is used for agricultural purposes. An unnamed watercourse and its tributaries cross the site at several locations. The watercourse flows to the southeast and eventually drains into Parrott's Bay. A rail line crosses the site in an east-west direction. Significant woodlands identified in the Central Cataraqui Region Natural Heritage Study (CCRNHS) (CRCA, 2006) cover the central portion of the property adjacent to the rail line. Small pockets of Contributory Woodlands are also located on the site adjacent to significant woodlands (see attached map).

Millhaven Creek flows along the north side of Millhaven Road, within 120 m of the subject lands. An unevaluated wetland is located along Millhaven Creek, north of Millhaven Road.

The subject lands are currently designated 'Agricultural' and 'Rural' in the Loyalist Township Official Plan and are zoned 'Prime Agriculture' (PA) and 'Rural' (RU) in the Zoning By-law. The land adjacent to the watercourse and its tributaries are designated and zoned 'Environmental Protection.' The significant woodlands have an 'Environmentally Sensitive' overlay in the Official Plan.

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Member of



Conservation  
ONTARIO  
Nature's Champions

## **Watercourses**

### Unnamed Watercourse and Tributaries

A watercourse and its tributaries flow through the site and are identified as Environmental Protection Areas on Schedule B of the Official Plan. The Environmental Protection Area designation applies to land within 30 m of the highwater mark of a waterbody for which there is no floodplain mapping. Policy 4.2.4.1 of the Official Plan states that an Environmental Impact Assessment (EIA) may be required for development applications on or near lands designated Environmental Protection. In this case, the flooding hazard component of the Environmental Protection designation could be evaluated by a qualified hydrologic professional, should development be proposed in this area.

### Flooding Hazard

The CRCA does not have engineered 1:100 year floodplain mapping for the watercourse or its tributaries. The CRCA, in accordance with Section 2.2 of the Provincial Policy Statement and under Ontario Regulation 148/06: *Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses*, restricts alteration to and development near or across a watercourse. The CRCA requires that future development be located a minimum distance of 30 m from the average high water mark or top of bank of a waterbody when the elevation of the regulatory floodplain is unknown. Similarly, Section 5.4.6 (d) of the Loyalist Township Official Plan and Section 4.11 (c) of the Zoning By-law require new buildings or structures to be set back 30 m from the high water mark where a floodplain has not been defined. In addition, Section 4.11 (b) of the Zoning By-law requires a 15 m setback from lands zoned Environmental Protection.

### Erosion Hazard

Based on aerial photography, the watercourse and the tributaries appear to be meandering watercourses. 'Meandering' often occurs under conditions such as heavy or rapid runoff or spring snow melt, and results in changes to flooding and erosion patterns. The erosion hazard limit or meander belt allowance is defined as the maximum extent to which a water channel migrates over time. The Natural Hazard Training Manual (Ministry of Natural Resources, 1997) defines the meander belt allowance as 20 times the bankfull channel width for a particular section of a creek. Ontario Regulation 148/06 applies to lands within the meander belt allowance and 15 m beyond the meander belt on either side. The extent of the regulated area will be determined at the time of a site inspection when a formal application is made.

### Water Quality

Section 5.4.6 (g) of the Official Plan of Loyalist Township indicates that a natural vegetative buffer strip of 15 m should be maintained adjacent to the edge of a watercourse to filter pollutants. The Official Plan does not permit clear cutting of trees within this buffer area. The CRCA Planning Policy also requires a minimum 30 m setback from the annual high water line of a waterbody for development adjacent to all waterbodies in order to preserve their hydrological and biological functions.

## Millhaven Creek

Millhaven Creek flows on the north side of Millhaven Road within 120 m of the subject lands. The regulatory floodplain of Millhaven Creek at this location varies between 102.6 m and 103.3 m GSC. The CRCA, under Ontario Regulation 148/06 requires that development and site alteration be setback a minimum distance of 5 m from the regulatory floodplain of Millhaven Creek.

## **Unevaluated Wetland**

An unevaluated wetland is located outside of the subject lands, but within a distance of 120 m. The wetland is located along the south side of Millhaven Creek, and north of Millhaven Road. The CRCA, under Ontario Regulation 148/06 requires that development and site alteration be setback a minimum of 30 m from the unevaluated wetland.

## **Significant Woodlands**

The Central Cataraqui Region Natural Heritage Study (CCRNHS) (CRCA, 2006) identifies areas of 'Significant Woodlands' and 'Contributory Woodlands' present on the subject property. The wooded area was identified as significant based on its area. Pockets of contributory woodlands directly abut with the area identified as significant woodlands.

Policy 2.1.4 of the Provincial Policy Statement (2005) does not permit development and site alteration in significant woodlands unless negative impacts can be mitigated. Policy 5.4.7.1 (f) of the Official Plan for Loyalist Township requires that "development be carried out in a manner that encourages the protection and management of woodlands," and that development applications affecting significant woodlands be "accompanied by a strategy maximizing the woodland areas to be protected." The CRCA requests that every effort be taken to protect the Significant and Contributory Woodlands. The CRCA recommends that an environmental impact assessment and a tree preservation plan be prepared should development be proposed in Significant Woodlands.

## **Endangered and Threatened Species**

Wildlife within the creeks and wooded areas may contain species that are protected under Provincial and Federal Endangered Species legislation. CRCA staff suggest that you contact the Ministry of Natural Resources to discuss obligations/restrictions that may need to be followed. The MNR contact is Todd Norris at the Kingston Area office at (613) 531-5728.

## **Summary**

The property is subject to Ontario Regulation 148/06: *Development, Interference with Wetlands, and Alterations to Shoreline and Watercourses*. Permits will be required for any proposed development and site alterations within 30 m of the average high water mark or top of bank of any watercourse on the subject property and for any in-water works, or within 15 m of the meander belt allowance of any watercourse, or within 15 m of the regulatory floodplain of

Mr. Misch  
June 10, 2010

Millhaven Creek, or within 30 m of the unevaluated wetland. Permits will also be required for any proposed development and site alteration within 30 m of any unmapped waterbodies/wetlands found at the time of a site inspection when a formal application is made. CRCA staff will review the application in light of Ontario Regulation 148/06 and CRCA policies before deciding to issue or refuse the permit.

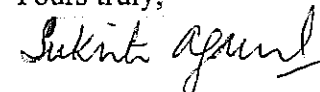
We trust that the above has addressed your inquiry. Please note that these comments reflect our understanding, at the time of writing, of the best available data, applicable policies and regulations. Changes in one or more of these factors may influence our comments. As noted previously, the site was not visited.

### **CRCA Fee**

The CRCA charges fees for inquiries; the current fee for a property inquiry without a site visit is \$120. We request that payment of this fee be submitted to this office at your earliest convenience.

If you have any questions please contact the undersigned at (613) 546-4228 extension 258 or by e-mail at [sagarwal@cataraquiregion.on.ca](mailto:sagarwal@cataraquiregion.on.ca).

Yours truly,



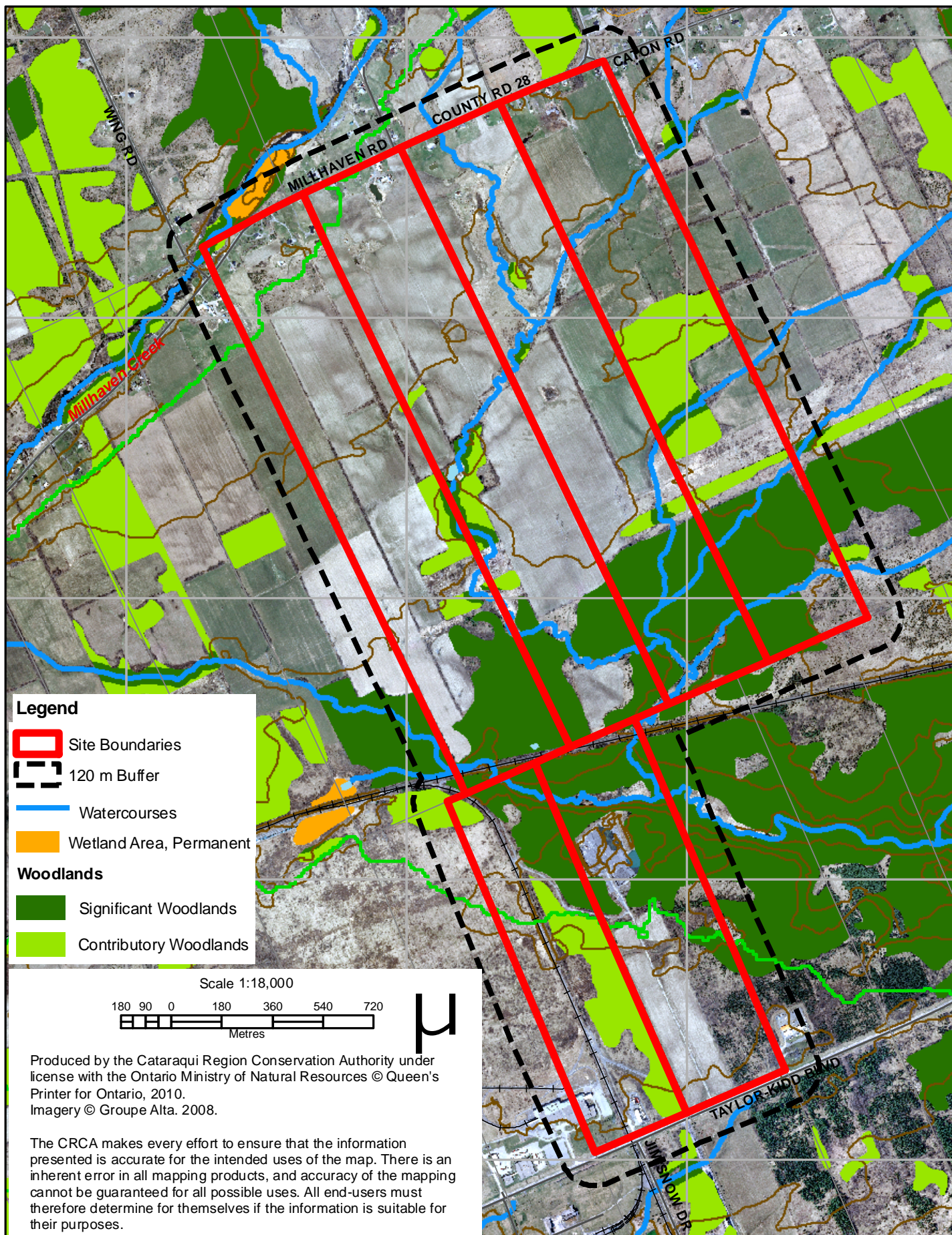
Sukriti Agarwal, AICP  
Environmental Planner

cc: Murray Beckel, Director of Planning and Development Services, Loyalist Township, via email

Attachment (s): Map showing the location of watercourses, and significant and contributory woodlands on the subject lands

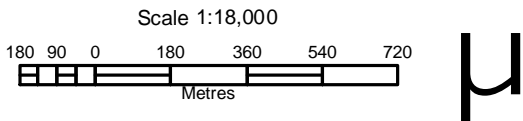


**Site Inquiry**  
**Lots 25-26, Concession 1; and Lots 25-28, Concession 2; Ernestown, Loyalist Township**



**Legend**

- Site Boundaries
- 120 m Buffer
- Watercourses
- Wetland Area, Permanent
- Woodlands**
- Significant Woodlands
- Contributory Woodlands



Produced by the Cataraqui Region Conservation Authority under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2010.  
 Imagery © Groupe Alta. 2008.

The CRCA makes every effort to ensure that the information presented is accurate for the intended uses of the map. There is an inherent error in all mapping products, and accuracy of the mapping cannot be guaranteed for all possible uses. All end-users must therefore determine for themselves if the information is suitable for their purposes.



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## Records Review Ernestown

10 messages

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**Emony Nicholls** <emony.nicholls@mkince.ca>

Fri, Jun 1, 2012 at 4:30 PM

To: eric.prevost@ontario.ca

Cc: bvantassel@horizonlegacy.com, Thomas Bernacki <thomas.bernacki@mkince.ca>, Emony Nicholls <emony.nicholls@mkince.ca>

Dear Mr. Prevost,

Please find attached a letter requesting water body assessment records for the Ernestown Wind Park.

Thank you very much,

Emony Nicholls  
MNInce and Associates Ltd.

---

 **MNR-map letter.pdf**  
523K

---

**Prevost, Eric (MNR)** <eric.prevost@ontario.ca>

Mon, Jun 4, 2012 at 8:11 AM

To: Emony Nicholls <emony.nicholls@mkince.ca>

Dear Emony,

Thank you for your request for records. However, as noted on a number of occasions relative to this project, MNR has provided a confirmation of records to the proponent relative to this project. To date, MNR has no further information relative to your request. I suggest that you contact the proponent directly with respect to these previous correspondence.

In addition, the Ministry of Natural Resources, in partnership with others, maintains a number of information sources and data exchanges which are available to proponents and the general public. These information sources provide access to geospatial data through a number of free, and pay per use, tools to assist developers and the general public in supporting their information and development needs. At this time, we are asking clients to first consider publicly available means of accessing information related to the development of their projects or proposals.

Please access the following websites, as they are sources of information for your Record Review Report;

- Land Information Ontario ([http://www.mnr.gov.on.ca/en/Business/LIO/2ColumnSubPage/STEL02\\_167950.html](http://www.mnr.gov.on.ca/en/Business/LIO/2ColumnSubPage/STEL02_167950.html)) is a repository of land and geospatial data related to a number of natural resources and land feature classes.
- The Species at Risk in Ontario List (SARO) List ([http://www.e-laws.gov.on.ca/html/regs/english/elaws\\_regs\\_080230\\_e.htm](http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080230_e.htm)) is the primary source of information about the status of

species at risk in Ontario.

- Natural Heritage Information Centre (NHIC) is the central provincial database for species at risk occurrence information. New NHIC Website <http://www.biodiversityexplorer.mnr.gov.on.ca/nhicWEB/>
- Ontario Crown Land Use Atlas (<http://crownlanduseatlas.mnr.gov.on.ca/>) Atlas of crown land use policies for a number of large areas and source for determining location of crown land areas
- Ontario Wind Resource Atlas (<http://www.ontariowindatlas.ca/>) Data with respect to natural heritage and base layer features
- MNR Species at Risk Website (<http://www.mnr.gov.on.ca/en/Business/Species/index.html>) provides additional information on species at risk and the Endangered Species Act, 2007.

In addition to the sources listed above, we also suggest that you consult peer reviewed and published material which may describe any natural features or species which may be present on your site such as;

- Breeding Bird Atlas (<http://www.birdsontario.org/atlas/index.jsp>)
- Aquatic species at risk information on the Conservation Ontario site (<http://conservation-ontario.on.ca/projects/DFO.html>)

Once you have consulted the aforementioned sources, and prepared a map and report outlining the information found through such, our office will be pleased to assist you in refining the information you gathered, or discrepancies found during your search, through a thorough internal file review.

Lastly the following is a list of MNR resources which will assist you in the development of appropriate work-plans for the site investigation. MNR strongly suggests that you provide draft terms of reference for your field work-plan to ensure that you are capturing the appropriate data and using the most appropriate methodologies.

- Natural Heritage Assessment Guide for Renewable Energy Projects
- MNR's Birds and Bird Habitat and Bats and Bat Habitat Guidelines for Windpower Projects
- Significant Wildlife Habitat Technical Guide
- Significant Wildlife Habitat Eco-Region Criteria Schedules
- Natural Heritage Reference Manual
- Ecological Land Classification
- Ontario Wetland Evaluation
- Great Lakes Conservation Blueprint for Terrestrial Biodiversity

Should you have any questions, or require further clarification, please feel free to me directly.

Eric R. Prevost

Renewable Energy

Planning Ecologist

Ontario Ministry of Natural Resources

Peterborough District

300 Water Street

Peterborough, ON K9J 8M5

[Eric.Prevoست@Ontario.ca](mailto:Eric.Prevoست@Ontario.ca)

Phone: (705) 755-3134

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From: Emony Nicholls [mailto:[emony.nicholls@mkince.ca](mailto:emony.nicholls@mkince.ca)]  
Sent: June 1, 2012 4:30 PM  
To: Prevoست, Eric (MNR)  
Cc: [bvantassel@horizonlegacy.com](mailto:bvantassel@horizonlegacy.com); Thomas Bernacki; Emony Nicholls  
Subject: Records Review Ernestown

[Quoted text hidden]

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**Emony Nicholls** <[emony.nicholls@mkince.ca](mailto:emony.nicholls@mkince.ca)>  
To: Thomas Bernacki <[thomas.bernacki@mkince.ca](mailto:thomas.bernacki@mkince.ca)>

Mon, Jun 4, 2012 at 9:38 AM

[Quoted text hidden]

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**Thomas Bernacki** <[thomas.bernacki@mkince.ca](mailto:thomas.bernacki@mkince.ca)>  
To: Emony Nicholls <[emony.nicholls@mkince.ca](mailto:emony.nicholls@mkince.ca)>

Mon, Jun 4, 2012 at 10:15 AM

Thanks Emony. I'll follow up with Bonnie on this. In the meantime can you please continue with the database searches (if you haven't done them already?)

Thanks,  
Tom

[Quoted text hidden]

--

**Thomas Bernacki, P.Eng.**  
**M.K. Ince and Associates Ltd.**

11 Cross St., Dundas, ON L9H 2R3

Phone: [905-628-0077](tel:905-628-0077)

Fax: [905-628-1329](tel:905-628-1329)

E-mail: [thomas.bernacki@mkince.ca](mailto:thomas.bernacki@mkince.ca)

<http://www.mkince.ca>

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**Thomas Bernacki** <[thomas.bernacki@mkince.ca](mailto:thomas.bernacki@mkince.ca)>  
To: Emony Nicholls <[emony.nicholls@mkince.ca](mailto:emony.nicholls@mkince.ca)>

Mon, Jun 4, 2012 at 12:51 PM

Hi Emony,

Here is some information from Horizon re: Ernestown water bodies. Please organize the data appropriately; when it is time to prepare the reports we may need to refer to this data.

Thanks,  
Tom

----- Forwarded message -----

From: **Greg McQuat** <[gmcquat@horizonlegacy.com](mailto:gmcquat@horizonlegacy.com)>

Date: Mon, Jun 4, 2012 at 12:26 PM

Subject: Re: Records Review Ernestown

To: Bonnie Van Tassel <[bvantassel@horizonlegacy.com](mailto:bvantassel@horizonlegacy.com)>, Thomas Bernacki <[thomas.bernacki@mkince.ca](mailto:thomas.bernacki@mkince.ca)>, Nhung Nguyen <[nnguyen@horizonlegacy.com](mailto:nnguyen@horizonlegacy.com)>

Tom,

I have attached records from LIOW:

Wooded Area  
Watershed (Tertiary)  
Watershed (Quaternary)  
Wetland Units  
Beaver Dam  
Soil Complex  
Drainage Line  
Tile Drainage Area

You already have the base watercourse data. The waterbody and contour data for this area is quite large - I'm sure you already have base map data or can easily download it.

I have no data from the other sources mentioned in E. Prevost's response.

Cheers,

Greg

I had previously forwarded the watercourse base map data and I presume you will have no trouble acquiring base map waterbody from either LIO

On Mon, Jun 4, 2012 at 11:18 AM, Bonnie Van Tassel <[bvantassel@horizonlegacy.com](mailto:bvantassel@horizonlegacy.com)> wrote:

Can you folks please forward your records and communications?

Bonnie Van Tassel

Project Coordinator, Horizon Legacy Energy Corp.

Phone: 416.864.9977 x 8222

[bvantassel@horizonlegacy.com](mailto:bvantassel@horizonlegacy.com)

----- Forwarded message -----

From: **Thomas Bernacki** <[thomas.bernacki@mkince.ca](mailto:thomas.bernacki@mkince.ca)>

Date: Mon, Jun 4, 2012 at 10:21 AM

Subject: Fwd: Records Review Ernestown

To: Bonnie van tassel <[bvantassel@horizonlegacy.com](mailto:bvantassel@horizonlegacy.com)>

Hi Bonnie,

I just want to reiterate our request for any records review information that you have available, with respect to

water bodies or NHA. We trust that the NHA records review will be signed off shortly, so presumably that's well in hand, but for the records review for the water bodies work we are conducting presently the MNR has basically said "We already told you, go back to the proponent and get the info we already gave them". So anything you have would be helpful.

Regards,  
Tom

[Quoted text hidden]

[Quoted text hidden]

[Quoted text hidden]

[Quoted text hidden]

MKInce and Associates Ltd.

--

**Thomas Bernacki, P.Eng.**  
**M.K. Ince and Associates Ltd.**

11 Cross St., Dundas, ON L9H 2R3

Phone: 905-628-0077

Fax: 905-628-1329


E-mail: [thomas.bernacki@mkince.ca](mailto:thomas.bernacki@mkince.ca)


<http://www.mkince.ca>


[Quoted text hidden]


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## 5 attachments

 **sc20-lio-2008-10-11-015047-333325.zip**  
11K

 **sc20-lio-2008-10-11-020341-333351.zip**  
61K

 **sc20-lio-2008-10-11-020226-333350.zip**  
67K

 **sc20-lio-2008-10-11-013837-333309.zip**  
1388K

 **LIOW.zip**  
1718K

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**Emony Nicholls** <[emony.nicholls@mkince.ca](mailto:emony.nicholls@mkince.ca)>  
To: Thomas Bernacki <[thomas.bernacki@mkince.ca](mailto:thomas.bernacki@mkince.ca)>

Mon, Jun 4, 2012 at 1:53 PM

The downloads are all map layers that I cannot open- should this all be saved for when the mapping starts? any idea when we will get the SOLRIS or OBM maps?

Thank you

e

[Quoted text hidden]

**Thomas Bernacki** <thomas.bernacki@mkince.ca>  
To: Emony Nicholls <emony.nicholls@mkince.ca>

Mon, Jun 4, 2012 at 1:59 PM

Don't know. Should I ask the client? Or should we just download the stuff ourselves? I think we have OBM data already anyway. Where do we get SOLRIS from?

Tom

[Quoted text hidden]

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**Emony Nicholls** <emony.nicholls@mkince.ca>  
To: Thomas Bernacki <thomas.bernacki@mkince.ca>

Mon, Jun 4, 2012 at 2:45 PM

Tom,

I have downloaded the map layers and will save them in the Y drive. Christine says that we can then just move them into Manifold- (which i don't have but could no doubt ask someone for help on). SOLRIS is apparently another mapping system that the GIS girls use to do the maps and id of things like water bodies.

by the way, what is the projected date for having this done?

e

[Quoted text hidden]

---

**Thomas Bernacki** <thomas.bernacki@mkince.ca>  
To: Emony Nicholls <emony.nicholls@mkince.ca>

Mon, Jun 4, 2012 at 3:02 PM

June 12, but we said records review would not be done by then due to the expectation that we wouldn't hear from the agencies soon enough. So basically we'll have a framework for water bodies records review, but as for site investigation material, EIS, we'd have Drafts ready for the 12th.

Tom

[Quoted text hidden]

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**Emony Nicholls** <emony.nicholls@mkince.ca>  
To: Thomas Bernacki <thomas.bernacki@mkince.ca>

Tue, Jun 5, 2012 at 8:46 AM

good morning Tom,

I thought we were not doing the site investigation- but we are now? as well as the EIS- sorry but I somehow missed that detail. I will get started on them. I have to do a records review for Katie and Centreton too now and unfortunately I leave on Friday and will be gone all next week on an ELC course- back Monday the 18th.

emony

[Quoted text hidden]

## **APPENDIX B – CURRICULA VITAE**



## **BIOGRAPHY**

Daniel Stuart is a Renewable Energy Biologist for M.K. Ince and Associates. He graduated from the University of Guelph with an Honours Bachelor of Science degree in the field of Ecology.

Daniel's background includes academic research involving the study of both flora and fauna for the University of Guelph as well as mitigation, monitoring and assessment work for the consulting industry. His work experience has contributed to equal proficiency in both field and office settings.

Daniel has considerable knowledge of species identification and the dynamics of ecological interactions in Ontario. These skills are particularly valuable to the REA Application process. He is an active member of the Field Botanists of Ontario. Along with his avid botany pursuits, Daniel is an enthusiastic hiker and canoeist. His outdoor interests have brought him to mountainous trails, rivers and lakes in places such as Western Canada, the American Southwest, Switzerland, Italy, France, and New Zealand. These experiences have instilled in him a respect for the natural world, and a belief that the development of renewable energy sources is essential for the future of our natural environment.

## **EXPERIENCE**

- Field work with vascular plants, small mammals, amphibians and reptiles often in remote areas and in all weather conditions
- Data analysis and reporting
- Synthesis of information necessary for the writing of pre-construction reports for commercial-scale wind energy projects.
- Cultural awareness experience with First Nations communities in Ontario

## **EDUCATION**

- B.Sc., Honours, Ecology, University of Guelph, 2010

## **AFFILIATIONS**

- Field Botanists of Ontario, member

## **PROJECT EXPERIENCE**

- ZEP Wind Farm Ganaraska, Whispering Woods Wind Farm, Wind Farm Collie Hill, Grey Highlands ZEP Wind Park, Grey Highlands Clean Energy, Clean Breeze Centreton Wind Park, Snowy Ridge Wind Park, Settler's Landing Wind Park, Bow Lake Phase 1 and Phase 2 Wind Farms – REA Application Process
- Organization and implementation of biological field studies for all projects listed above

## **PRIOR WORK / VOLUNTEER EXPERIENCE**

- LGL Limited. Detroit River International Crossing: Mitigation and monitoring for large-scale ecological restoration project
- LGL Limited. Former Camp Ipperwash: Transect surveys observing for floral Species at Risk in Ontario
- University of Guelph. Small Mammal Research: Participation in long-term population study of small mammals in Algonquin Park
- University of Guelph Herbarium. Assistant to the Curator: Mounting, repairing, and filing of vascular plant specimens into the University of Guelph collection

## BIOGRAPHY

Dave Jolly is a Senior Biologist/Ecologist with expertise in all aspects of terrestrial and wetland ecology and has been involved with Class 1 to 4 renewable energy projects since 2008. At M.K. Ince and Associates Ltd. (MKI) Dave is presently involved in ELC, wetland assessments, and wildlife habitat surveys as part of pre-construction Environmental Assessment, Natural Heritage reporting and the new REA processes for over a dozen commercial scale wind power projects across Ontario.

Before joining MKI, Dave has worked for all levels of government and non-government agencies as well the education and private sector in Canada, the United States, Panama, Costa Rica, Peru, Mexico, and Nepal. He has experience in training environmental professionals in areas that include but are not limited to methodology and protocols for performing ecological studies, GIS, environmental law, flora and fauna identification including Species at Risk, Ecological Land Classification (ELC), Ontario Wetland Evaluation System, natural heritage assessments, and environmental assessments. Dave has experience as an expedition leader/scientist designing, marketing and operating over 20 international research and conservation expeditions to Central, South America and southeast Asia to study primates, plants, birds and mammals. He is skilled in all aspects of the environmental consulting process (with over 10 years of experience), project development/management and managing client relations. Dave has secured numerous government contracts valued at > \$100 000 each and is fully adept in GIS, ELC, Wetland evaluation, staff management, environmental and site assessments.

In his spare time Dave enjoys hiking in search of various vascular plants including Species at Risk, writing books, photography, assisting non-profit organizations with their natural heritage inventories and spending time with family.

## EXPERIENCE

- Facilitated regulatory approvals under the *Migratory Birds Convention Act*, *Fish and Wildlife Act*, *Conservation Authorities Act*, *Provincial Policy Statement*, *provincial and federal Species at Risk Act*, *provincial and federal Endangered Species Act*, *Planning Act*, *Ontario Environmental Assessment Act* and the *Canadian Environmental Assessment Act*
- Provided expertise and senior review to over 100 terrestrial and wetland biophysical assessments including wetland studies and monitoring projects, Ecological Land Classification projects, various Species at Risk projects
- Environmental inspection and compliance monitoring for construction projects in York, Durham, and Niagara Regions
- Trained environmental professionals through teaching and designing over 30 certification courses that are exempt from registration from the Ontario Ministry of Training and Colleges and Universities
- Extensive experience in negotiations and business development with Métis and First Nation groups

## EDUCATION

- B.Sc., Ecology and Evolution, University of Western Ontario, 1992

## AFFILIATIONS

- Field Botanists of Ontario, member
- Haldimand Bird Observatory, member

## TRAINING/CERTIFICATIONS

- Lichen identification, 2012
- Bear Awareness, 2011
- Ice Safety, 2011
- Project management/ leadership, 2004
- Ontario Wetland Evaluation Systems, 2008
- Ecological Land Classification for Southern Ontario, 2004
- Standard First Aid and CPR certified

## PROJECT EXPERIENCE

- ZEP Wind Farm Ganaraska, Next Era Wind Farm, Ernesttown Horizon Wind Farm, Port Ryerse Wind Farm, Grey Highlands ZEP Wind Park, Grey Highlands Clean Energy, Clean Breeze Centreton Wind Park, Clean Breeze Grafton Wind Park, Dufferin Wind Farm, Bow Lake Phase 1 —REA Application Process
- Organization and implementation of biological field studies for all projects listed above

## PRIOR WORK / VOLUNTEER EXPERIENCE

- Senior Biologist/Ecologist: Dillon, AECOM, EARTHQUEST, Avalon Professional Consultants of Ontario, Fieldlife Environmental Consultants
- Senior Instructor & President: EARTHQUEST Biological Field School.
- Volunteer Botanist for the Grand River Conservation Authority
- Designed, published and marketed five field guide books on flora and fauna of Ontario and the Bruce Trail system
- Designed, marketed and operated over 20 international research/conservation expeditions to Central, South America and southeast Asia

## APPENDIX C – FIELD NOTES

Ernesttown

2012-05-31

Dave Jolly 300

Waterbody  
assessment

Cloud: 8/10

1545 - 2032

Wind: 2

Temp: 22°C

362848 4896975

ERN301

• heard ERANE ~120m

5 photos → south  
of Taylor Kidd  
Blvd on Jim  
Snow Dr

no watercourses/  
waterbodies  
looking west

362851 4897014

ERN302

5 photos south of  
Taylor Kidd Blvd  
on Jim Snow Dr

looking east  
no watercourses/  
waterbodies

362791 4897074

ERN303

Drainage ditch

N-S of Jim Snow

Dr - Taylor Taylor  
Kidd Blvd

5 photos  
natural veg CARREAR

362823 4897089

ERN DITCH 301

Greasy roadside  
ditch on north side  
of Taylor Hill Blvd  
SCIMACR, CARBEBB  
SCIHTR0, SARRETR  
TYPHANOU

362623 4897456

ERN 303

Grassy ditch  
parallel to rail  
trucks N-S  
S photos  
no watercourse/  
waterbodies

362571 4897614

ERN 304

Willow thicket  
S photos  
no watercourse/  
waterbodies

362480 4897831

ERN DITCH 302

Drainage ditch  
from gravel quarry  
vegetated; dominant  
plants = CARSTIP  
LYTSALI, water  
plantain

SCIMACK, CARLASE  
H<sub>2</sub>O temp = 20.9°C

362375 4898044

ERNALVAR301

Small patch on  
west side of rail  
fracture, PEN0161=  
3 groups of ~25  
plants  
5 photos

362409 4898317

ERAWA301

WA301

Water course  
6 photos, upstream,  
downstream flow E  
• 1:35 PM WD  
flushed  
depth 5-7cm  
H<sub>2</sub>O temp = 16.4

362506 4898280

ERAWA302

full water body  
assessment  
@ crossing 4  
• YBCU 1813  
can hear ATVs  
on trail &  
trucks in quarry

• COYE 1821  
• Grant tiger 1821  
Yucca stand

362984 4898291

ERNBARS301

• BARS foraging  
over marsh  
4 photos  
many w tined deer  
tracks

362027 4898857 5 photos

ERNALVAR302

Red cedar  
dominant

362974 4897949

ERNATI

T1 laydown  
area

5 photos

362876 4897897

ERNABMI

5 photos  
W tined deer  
WD in S

Ernesttown  
Dawe Jolly 300  
Wind: 2  
Cloud: 10/10  
Temp: 11°C

2012-06-01  
Waterbody assessment

0815 - 1545

- 0900 WIFL
- 0921 N leopard frog
- 1 AMGO 0927
- CORA 0957

T18 362808 4898490  
WA303

Watercourse  
immediately south  
of CN tracks  
dried up no flow  
3 m dia culvert  
under tracks  
H2O flows S  
6 photos  
H2O temp = 14.4°C

- EAPH 1030

T18 362806 4898416

watercourse enters  
wetland @ 120m  
• SWSP 1042  
• SOSP 1042  
6 photos



- \* GBHE 1046
- MALL 07 1053
- TRSW ♀ 1053

362894/4898337

WA 305

Wetland meets  
120 - no water-  
course  
4 photos

- MALL ♀ 1102

362935/4898328

WA 306

(partial)  
waterbody assessment  
4 photos within  
120m of wetland  
conductivity =

52.2

pH = 7.2

Temp = 15.6°C

362958/4898330

WA 307A

Beaver dam/  
watercourse  
flaming snail  
6 photos

362971 4898329 1 photo  
 (LAm30) unknown clam spp

362990 4898330 watercourse  
 WA308 leaves 120m  
 4 photos  
 some pooling  
 H<sub>2</sub>O temp = 15.1°C

362817 4898529 north side of  
 WA309 culvert @ CN  
 tracks → water-  
 course  
 6 photos  
 H<sub>2</sub>O temp = 14°C  
 Flows South

362931 4898644 water body census  
 WA310 (pondy)  
 6 photos  
 conductivity = 413  
 H<sub>2</sub>O temp = 14.5°C  
 pH = 7.6  
 • COYE 1232  
 • JWSP 1232  
 • RBGR 1230

362976 4898685

WA 311

Edge of 120m  
for watercourse  
6 photos

362879 4898558

WA 312

Fully waterbody  
assessment  
6 photos  
water crossing  
3

• EATD 1315

362732 4898608

ERN OASMI 302

4 photos  
OASMI with 120m  
south edge

362717 4898755

ERN OASMI 303

8 photos  
OASMI within 120m  
north edge

3627203 4898780

WA 313

watercourse  
entering 120m  
east side  
6 photos

WTL 15 43  
N leopard frog  
tadpoles 134  
in pools

362563 4898878  
WA 314

6 photos - full  
water body near  
water cabins  
1  
5 SSP 14/20

362476 4898844  
SA 301

dead common  
snapping turtle  
1 photos

362445 4898890  
WA 315

Kelp at 1200  
E. end of pond  
west side  
6 photos

2012-06-07  
Dave Jolly 300

Ernestown  
Waterbody assessment  
1245-2045

Cloud: 2/10-10/10  
Wind: 2-4  
Temp 13.5-22.5°C

T18361944 4900604  
WAB9

Roadside ditch  
on north side of  
Milhaven Rd  
man-made/artificial  
with some ~~wetland~~  
vegetation = JUNCA  
TYPHATI  
5 photos

361950 4900580  
OAGM1307

Annual row crop  
Soybeans  
5 photos

361914 4900408  
WAB5

Partial waterbody  
assessment,  
DWES appendix C  
wetland delineated

• SPSA 1408 flooded  
from WAB5  
Pond = SPSA 15 photos  
730 yrs old  
surrounded by  
Reed canary grass  
• Green frog heard  
1413  
• RWBL 1413  
• KILL

No. 832  
Kittling, 2012

361953 4900468  
BARS301

• Adult BARS 1426

361959 4900487  
~~WASP~~

Natural channel  
from wetland  
& pond  
6 photos

361910 4900446  
WASL

Pond  
6 photos  
• White-fronted swamphen  
Dragonfly  
• SOSP alarm  
calls 1523  
in MAMM-3

361934 4900324  
OABM1302

Soybeans field  
for 7 yrs  
Spoke with owners  
(Bob) father @ 1530  
(Danzon) confirmed pond  
is natural &  
> 30 yrs old

362089 4900007

WA 86

Grassy swale edges  
within 120m  
5 photos

• Canada jay  
1552

• SOSP 1552

362189 4899972

ERN MON 301

• Monarch butterfly

1987

4 photos

362190 4899971

ERN EAME 301

• EAME 1558

4.0 min

362268 489940

WA 86B

Grassy swale  
leaves 120m

4 photos

partial water-  
body area

362329 489987

WA 87

watercourse

wetland leaves

120m on north  
side

4 photos

362252 4899708  
WA01B

wetland of watercourse  
4 photos  
r bad thru wetland  
has H2O  
• N leopard frog  
1657

362313 4899802  
WA01C

wetland  
6 photos  
• MAHA 1715  
• YEWB 1715  
• SOSP 1715

362364 4899876  
WA01D

wetland @  
ALV01  
4 photos

362411 4900034  
WA01E

wetland @  
watercourse  
= NO watercourse  
6 photos  
• RWBL 1739  
• SOSP 1739  
• TUNBL 1741  
• Common ringlet  
1739



362476 4900073 OAGM1 = Soyabeans  
OAGM1303 08WSP1744  
4 photos

362567 4900282 Graminoid  
WADIF MAM - 2 part of  
wetland  
4 photos  
• BOBO 20m E  
1802 using  
Timothy field

362713 4900374 pond part of  
WADIG 4 photos  
wetland  
• GBKE 1811

362638 4900076 Row crop = Soya-  
beans  
OAGM1304 5 photos

362613 4900094 Cultivated  
OAGM1305 Field, not  
soya beans  
6 photos

362278 489966 delimitated wetland  
WA81H to WA crossing #1  
5 photos

362261 4899678 Full water body  
WA81E WA crossing #1  
measurement  
6 photos

362289 4899766 FLC soil auger  
MAMI-3A 4 photos

362235 4899503 4 photos  
WA81S MAMI-3 center  
/ 20m  
• Porcupine 20m NE  
1955

361852 4900560 Grassy swale  
WA85D head of  
pond  
6 photos

361751 4900509 north side  
WA85E of grassy swale  
no watercourse

Return on Rain

160352

2012-06-08  
Dane Jolly 300

Ernestown  
ELC + OWES

Temp: 16.1°C  
Cloud: 7/10  
Wind: 1

Appendix C

0745 - 1915

361941 4900618

• BARS 0800  
• BOBO 30m W  
0800  
4 photos

362972 4897472  
096M1306

6 photos - row  
crops within  
quarry

362865 4898050  
WA08

Waterbody - pond  
in quarry  
6 photos

362446 4898051  
WA07

Natural pond  
- MAS  
5 photos  
Area = 0.16 ha

Full waterbody  
assessment

OWES Appendix  
ELC

• Green frog 0943  
• N. Leopard frog 0940  
• Garter snake 0940

Photo in the Rain

362445 4898052 ELC  
M482-1 5 photos

362476 4898094 Artificial pond  
WA301 5 photos  
↑ refers to WA405  
little - no wetland / aquatic vegetation  
∴ RUBR family with ♀ displaying  
1115

362567 4898129  
FOL2-1 Edge Edge of FOL2-1  
• Giant sweetwood  
1125

362579 4898201 FOL2-1 ELC  
FOL2-1 aeger  
• IAU BU 1205  
Uwl pellet  
5 photos (incl. wpl pellet)

362548 4898075 ELC aeger  
F067-1 4 photos

Return to Lib.

362557 4898044 FOLZ-1/FODT-1  
FOLZ-1 Edge 2 4 photos

362621 4897994 FOLZ-1/FODT-1  
FOLZ-1 Edge 3 4 photos

362658 4897944 CUT1-4  
CUT1-4 Edge 1 4 photos

362712 4897869 4 photos  
CUT1-4 Edge 2

362706 4897808 ELL auger  
FODT-2 4 photos

362689 4897748 FODT-2/CUT1-4  
CUT1-4 Edge 3 4 photos

362719 4897701 ELL auger  
CUT1-4 4 photos

362825 4897592 CUT1-4/OAGMI  
CUT1-4 Edge 4 4 photos

362875 4897698 Wetland  
 MASS-1B 5 photos  
 Appendix C  
 partial waterbody  
 assessment  
 ELC

362887 4897718 ELC soil  
 MASS-1B soil 4 photos

362967 4897733 OPA6M1/CUT1-4  
 CUT1-4 Edges 4 photos

363004 4897756 FOL2-1/CUT1-4  
 FOL2-1 Edge 4 5 photos

363073 4897703 FOL2-1/CUT1-4  
 FOL2-1 Edges 5 4 photos leaves  
 120m  
 • EATU 1611

363099 4897753 FOL2-1/~~CUT1-4~~  
 FOL2-1 Edge 6 4 photos

363081 4897740 4 photos  
 CUM1-1 ELC soil

361952 4900497

BARS307

oo BARS 1808

361998 4900438

MAMM-3B

ELC soil auger  
4 photos

- DSPR 1900

flying over  
Project location

Spoke with land  
owner Dan

about land use  
& wetlands

No. 352

2012-06-09  
Dave Jolly 300  
Wind: 1  
Cloud: 10/10  
Temp: 16.5 to 19.7°C

Ernestown  
ELL, water body assess  
Appendix C  
0930-0930

362023 4900143  
BARKS 304

4 photos  
• 110 Orange sulphur butterfly

362415 4899887  
BWD 2-2  
ELL

ELL angon  
4 photos  
• EWPE 1218  
• EACE 1302  
• Virginia crested hawk moth 1305  
• WIFL 1313

362360 4899908  
ALV 01307  
delimited  
alvar

Area = 4.89 ha  
4 photos

362363 4899846  
MEMM 3  
ELL

ELL angon  
3 photos

Plot in the Park



362310 4900014 ELC anger  
ALV307 5 photos  
ELL

o 12 spotted skimmer  
1628

362619 4898978  
MEMM3 Edge 1 4 photos

362729 4899047  
MEMM3 Edge 2 4 photos

362732 4899040  
MEMM3 Edge 3 4 photos

362771 4898973 ELC anger  
FOD2-3 4 photos  
ELL

362794 4898824  
FOD2-3 Edge 1 4 photos

0362835, 4898816  
WA 02 EDGE 1

4 photos wetland  
ends on south side of  
watercourse and →

Notes on the Plate

vegetation is ~~TH~~ VOCCI

Eastern  
tailed blue  
1839

362953 4898668  
WA 02  
Full waterbody  
measurement

waterbody area  
4 photos  
60m break

363021 4898763  
WA 02 301  
Full Waterbody area

4 photos  
watercourse  
crossing

362960 4898806  
WA 02 302

4 photos  
60m break  
in wetland

362930 4898848  
WA 02 307

4 photos

Temp: Air 29°C On site: 10:30am  
Beaufort: 0 CC: 1/10  
no precip

WA13 (North Pond):

- Candidate turtle over-wintering area (sufficient depth very likely) - but, heavily polluted, may disqualify
- Stagnant, eutrophication evident
- No amphibians observed (GRTF heard in nearby woods)
- No wetland vegetation present. No wetland present.

WA\_\_ - (Southern Pond): (beyond 120m buffer)

- Does not qualify as candidate turtle over-wintering area - depth appears < 1m, freezes through very likely
- Numerous (>20) amphibians observed.
  - Green Frogs none calling
- No wetland veg. within pond/ along edges
- Turkey feathers present. Evidence of use.

Return to Page

SP302 (west sep):

- not running. Is a spring emerging from beneath tree roots growing atop limestone. Spring emerges from beneath rock.
- channel forms, approx 2m length before emptying into permanent stream.
- spits and small cobbles in channel
- some wetland veg. in channel
  - ↳ bugweed, duckweed, water plantain, jewelweed.

SP303:

- Not running. Source same type as SP302 above. Spring
- channel forms, approx 3m before emptying into wetland
- large boulders in channel
- some wetland veg in channel
  - ↳ arrowhead.

SP (outside 120m, east) - spring

- not running, emerges from underneath tree roots.
- channelization not present, but some indication spring runs for a short time of the year.
- soil/grass rill
- no wetland veg in channel. Mostly grassed.

offsite: 2:30pm

## **APPENDIX D – WATER BODY ASSESSMENT FORMS**



**M.K. INCE AND ASSOCIATES LTD.**  
WIND ENERGY ENGINEERING

**WATER BODY ASSESSMENT**

4

Project: Ernestown Horizon

Date: 2012-06-01

Field Crew: DJ

Water Body ID or description of location (if known) Permanent watercourse (water crossing #2)

Flow Regime (circle): Permanent Intermittent WADJA

UTM Coordinates (NAD83): 362563 easting 4998879 northing

Weather conditions in last 24 hours: Rain @ 10-20mm

Stream Velocity: 0 m/s estimated measured (circle one)

**In-Stream Cover:**

Cover Types Present (circle): undercut banks deep pool boulder cobble  
Total % Cover: 90 large organic debris small organic debris vegetation other

Notes: \_\_\_\_\_

**Bank Stability:**

% eroding	<u>0</u>	(bank angle > 45°, erodable soil, undercut banks or exposed soils)
% vulnerable	<u>0</u>	(bank angle > 45°, no sign of recent erosion)
% protected	<u>0</u>	(bank angle > 45°, non-erodable bank material)
% depositional	<u>100</u>	(bank angle < 45°, fine grained sediments)

Bank Stability Notes: \_\_\_\_\_

**Substrate:** Record substrate composition as a percentage

<u>10</u> Bedrock	_____ Silt	Substrate Notes: _____
_____ Boulder	_____ Clay	
<u>20</u> Cobble	<u>70</u> Muck	
_____ Gravel	_____ Marl	
_____ Sand	_____ Detritus	

**Stream Dimensions & Morphology:**

Stream Stage (circle one):	Low Flow	Moderate Flow	High Flow	Dry	Stagnant
Stream Width at High Flow (m):	<u>10</u>	<u>estimated</u>	measured	(circle one)	
Stream Wetted Width (m):	<u>1</u>	<u>estimated</u>	measured	(circle one)	
Pool Depth at High Flow (cm):	<u>20</u>	<u>estimated</u>	measured	(circle one)	
Pool Wetted Depth (cm):	<u>10</u>	<u>estimated</u>	measured	(circle one)	

Channel morphology (% riffle/run/pool/flat throughout reach; straightened/channelized, meandering, braided channel): \_\_\_\_\_

**Riparian Zone:**

Riparian vegetation (≤ 5 meters of the stream): \_\_\_\_\_

Adjacent land use (≤ 50 meters of the stream): \_\_\_\_\_

Canopy Cover: % closed \_\_\_\_\_ % partly open \_\_\_\_\_ % open \_\_\_\_\_

**Water Chemistry:** pH 7.8 Turbidity \_\_\_\_\_ estimated measured (circle one)  
Temperature (°C): 16.1 Conductivity: 49.8 Depth (at which chem. was taken) 5 cm

**Fish Habitat:** Yes No (circle one)



M.K. INCE AND ASSOCIATES LTD.  
WIND ENERGY ENGINEERING

# WATER BODY ASSESSMENT

Project: Ernestown

Date: 2012-06-01

Field Crew: DJ

Site Sketch:



Other Comments (details on fish habitat and fish species observed; include reference to photos):

Northern leopard frog tadpoles present in standing pool at crossing. Dead common snapping turtle found south of pool.  
Pollution sources: Agricultural field to Northwest  
Not suitable fish habitat, none observed



# WATER BODY ASSESSMENT



M.K. INCE AND ASSOCIATES LTD.  
WIND ENERGY ENGINEERING

Project: Ernestown

Date: 2012-06-01

Field Crew: DS

Water Body ID or description of location (if known) Intermittal watercourse (water cross Mg 3)

Flow Regime (circle):  Permanent  Intermittent WAQ2B

UTM Coordinates (NAD83): 12362879 easting 4898588 northing

Weather conditions in last 24 hours:

Stream Velocity: 0 m/s  estimated  measured (circle one)

### In-Stream Cover:

Cover Types Present (circle): undercut banks  deep pool   boulder  cobble  
Total % Cover: 70 large organic debris  small organic debris   vegetation  other

Notes:

Bank Stability: % eroding 0 (bank angle > 45°, erodable soil, undercut banks or exposed soils)  
% vulnerable 0 (bank angle > 45°, no sign of recent erosion)  
% protected 0 (bank angle > 45°, non-erodable bank material)  
% depositional 100 (bank angle < 45°, fine grained sediments)

Bank Stability Notes:

Substrate: Record substrate composition as a percentage  
95 Bedrock  Silt  Substrate Notes: \_\_\_\_\_  
 Boulder  Clay \_\_\_\_\_  
5 Cobble  Muck \_\_\_\_\_  
 Gravel  Marl \_\_\_\_\_  
 Sand  Detritus \_\_\_\_\_

### Stream Dimensions & Morphology:

Stream Stage (circle one): Low Flow  Moderate Flow  High Flow  Dry  Stagnant   
Stream Width at High Flow (m): 5  estimated  measured (circle one)  
Stream Wetted Width (m): 1  estimated  measured (circle one)  
Pool Depth at High Flow (cm): 30  estimated  measured (circle one)  
Pool Wetted Depth (cm): 0  estimated  measured (circle one)

Channel morphology (% riffle/run/pool/flat throughout reach; straightened/channelized, meandering, braided channel):  
None

### Riparian Zone:

Riparian vegetation (≤ 5 meters of the stream): Fleecampans, White ash, Red cedar  
Prickly ash

Adjacent land use (≤ 50 meters of the stream): CN tracks

Canopy Cover: % closed 0 % partly open 15 % open 95

Water Chemistry: pH None Turbidity \_\_\_\_\_ estimated  measured  (circle one)  
Temperature (°C): None Conductivity: None Depth (at which chem. was taken) \_\_\_\_\_

Fish Habitat: Yes  No  (circle one)



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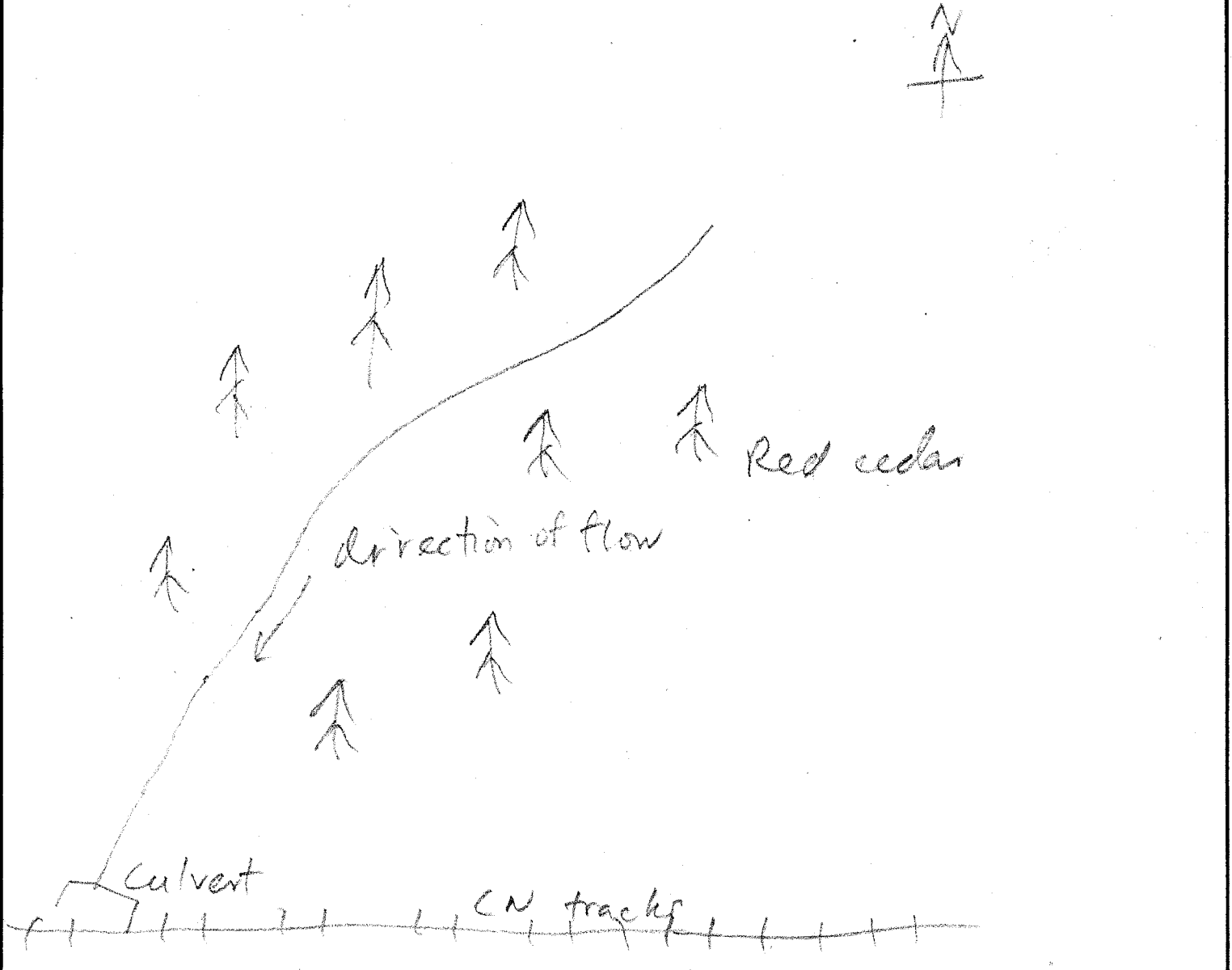
## WATER BODY ASSESSMENT

Project: Ernestown Horizon

Date: 2012-06-01

Field Crew: DJ

### Site Sketch:



### Other Comments (details on fish habitat and fish species observed; include reference to photos):

Water course completely dried up. Fish habitat, but none observed  
Pollution sources: CN tracks to south



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# WATER BODY ASSESSMENT

Project: Ernesttown Horizon

Date: 2012-05-31

Field Crew: DJ

photos DSC01472

Water Body ID or description of location (if known) <u>(WA 302) - permanent stream (crossing #4)</u>		<u>1474</u>
Flow Regime (circle):	<u>Permanent</u> Intermittent	<u>WAO2C</u>
UTM Coordinates (NAD83):	<u>362 506</u> easting <u>74898280</u> northing	
Weather conditions in last 24 hours: <u>mild, sunny - partially cloudy</u>		
Stream Velocity:	<u>1m/60sec</u> m/s <u>estimated</u> measured (circle one)	
<b>In-Stream Cover:</b>		
Cover Types Present (circle):	<u>undercut banks</u> deep pool <u>boulder</u> cobble	
Total % Cover:	<u>40%</u> large organic debris small organic debris vegetation other	
Notes: _____		
<b>Bank Stability:</b>		
% eroding	<u>0</u>	(bank angle > 45°, erodable soil, undercut banks or exposed soils)
% vulnerable	<u>0</u>	(bank angle > 45°, no sign of recent erosion)
% protected	<u>100</u>	(bank angle > 45°, non-erodable bank material)
% depositional	<u>0</u>	(bank angle < 45°, fine grained sediments)
Bank Stability Notes: _____		
<b>Substrate:</b> Record substrate composition as a percentage		
_____ Bedrock	<u>10</u> Silt	Substrate Notes: _____
<u>20</u> Boulder	_____ Clay	_____
_____ Cobble	_____ Muck	_____
<u>40</u> Gravel	_____ Marl	_____
<u>30</u> Sand	_____ Detritus	_____
<b>Stream Dimensions &amp; Morphology:</b>		
Stream Stage (circle one):	<u>Low Flow</u> Moderate Flow High Flow Dry Stagnant	
Stream Width at High Flow (m):	<u>3</u> <u>estimated</u> measured (circle one)	
Stream Wetted Width (m):	<u>1</u> <u>estimated</u> measured (circle one)	
Pool Depth at High Flow (cm):	<u>30</u> estimated measured (circle one)	
Pool Wetted Depth (cm):	<u>10</u> estimated measured (circle one)	
Channel morphology (% riffle/run/pool/flat throughout reach; straightened/channelized, meandering, braided channel): _____		
<b>Riparian Zone:</b>		
Riparian vegetation (≤ 5 meters of the stream): <u>Nanny berry, Downy arrowweed, Fowl manna grass</u> <u>Fragrant bedstraw, Purple loosestrife</u>		
Adjacent land use (≤ 50 meters of the stream): <u>Gravel quarry</u>		
Canopy Cover:	% closed <u>15</u> % partly open <u>60</u> % open <u>25</u>	
<b>Water Chemistry:</b>		
pH	<u>7.4</u> Turbidity <u>muddy</u> <u>estimated</u> measured (circle one)	
Temperature (°C):	<u>15.5°C</u> Conductivity: <u>37.1</u> Depth (at which chem. was taken) _____	
<b>Fish Habitat:</b> <u>Yes</u> No (circle one)		



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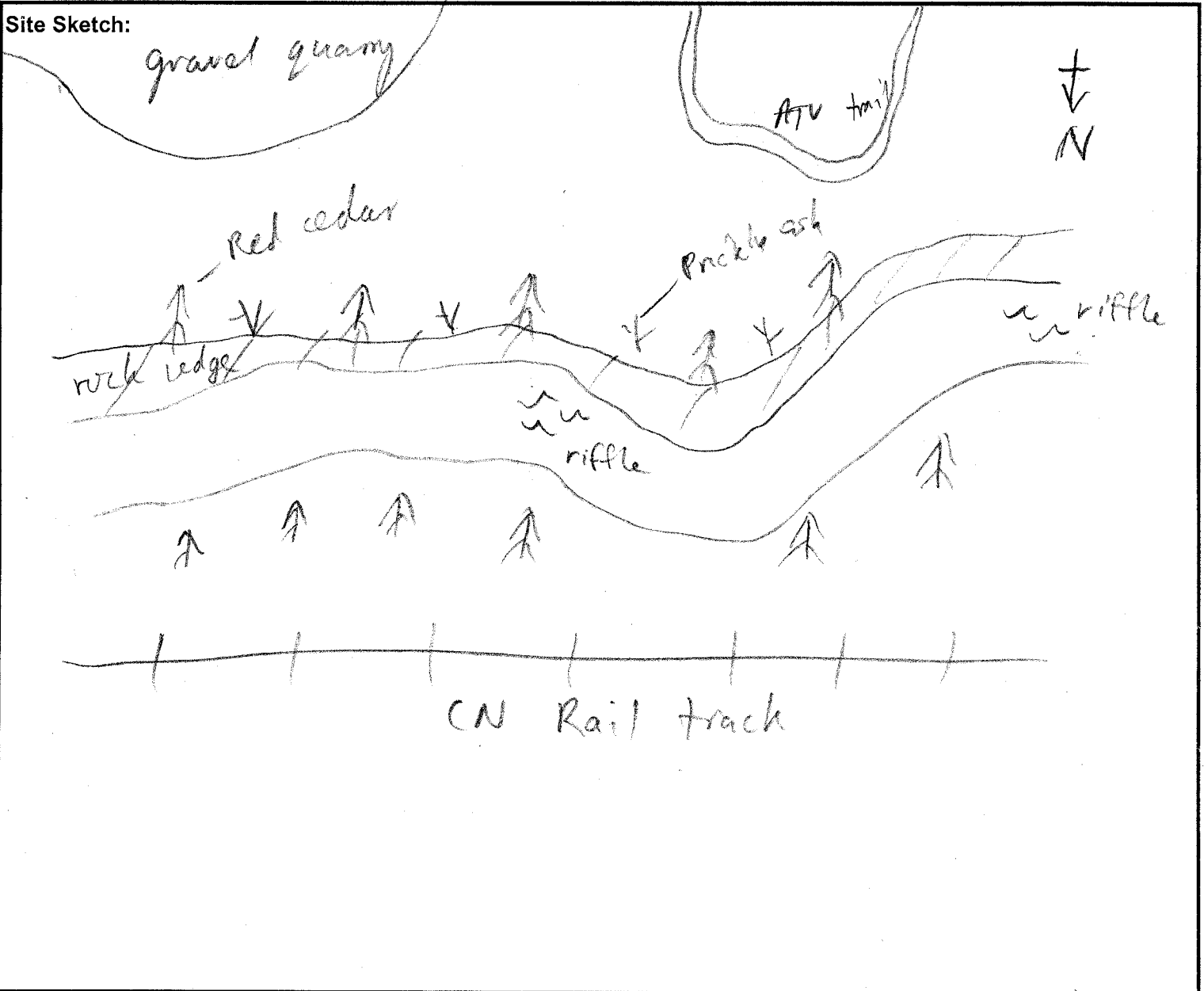
# WATER BODY ASSESSMENT

Project: Ernesttown Horizon

Date: 2012-05-31

Field Crew: DJ

## Site Sketch:



## Other Comments (details on fish habitat and fish species observed; include reference to photos):

Pollution sources:  
runoff sediments from CN tracks, quarry & ATV  
trails. Possible fish habitat. None observed



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# WATER BODY ASSESSMENT

8

Project: Ernestown

Date: 2012-06-08

Field Crew: DT

Water Body ID or description of location (if known) Pond-MAS-WA07 natural

Flow Regime (circle): Permanent Intermittent

UTM Coordinates (NAD83): 362446 easting 4898057 northing

Weather conditions in last 24 hours:  
Rain ≈ 5-10 mm

Stream Velocity: 0 m/s estimated measured (circle one)

**In-Stream Cover:**  
Cover Types Present (circle): undercut banks deep pool boulder cobble  
Total % Cover: 100 large organic debris small organic debris vegetation other  
Notes: \_\_\_\_\_

**Bank Stability:**

% eroding	<u>0</u>	(bank angle > 45°, erodable soil, undercut banks or exposed soils)
% vulnerable	<u>0</u>	(bank angle > 45°, no sign of recent erosion)
% protected	<u>0</u>	(bank angle > 45°, non-erodable bank material)
% depositional	<u>100</u>	(bank angle < 45°, fine grained sediments)

Bank Stability Notes: \_\_\_\_\_

**Substrate:** Record substrate composition as a percentage

Bedrock	_____	Silt	_____	Substrate Notes: _____
Boulder	<u>100</u>	Clay	_____	
Cobble	_____	Muck	_____	
Gravel	_____	Marl	_____	
Sand	_____	Detritus	_____	

**Stream Dimensions & Morphology:**

Stream Stage (circle one):	Low Flow	Moderate Flow	High Flow	Dry	Stagnant
Stream Width at High Flow (m):	<u>N/A</u>	estimated	measured	(circle one)	
Stream Wetted Width (m):	<u>N/A</u>	estimated	measured	(circle one)	
Pool Depth at High Flow (cm):	<u>N/A</u>	estimated	measured	(circle one)	
Pool Wetted Depth (cm):	<u>N/A</u>	estimated	measured	(circle one)	

Channel morphology (% riffle/run/pool/flat throughout reach; straightened/channelized, meandering, braided channel): \_\_\_\_\_

**Riparian Zone:**

Riparian vegetation (≤ 5 meters of the stream): Narrow leaved cattail, Common cattail, Reed Canary grass, Purple loosestrife, Canada rush, Bobb's sedge, Red fruited sedge

Adjacent land use (≤ 50 meters of the stream): Asphalt plant, heavy machinery tracks across wetland on south side

Canopy Cover: % closed \_\_\_\_\_ % partly open \_\_\_\_\_ % open 100

**Water Chemistry:** pH 8.4 Turbidity clear estimated measured (circle one)  
Temperature (°C): 20.4 Conductivity: 34.5 Depth (at which chem. was taken) 10cm

Fish Habitat: Yes No (circle one)



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# WATER BODY ASSESSMENT

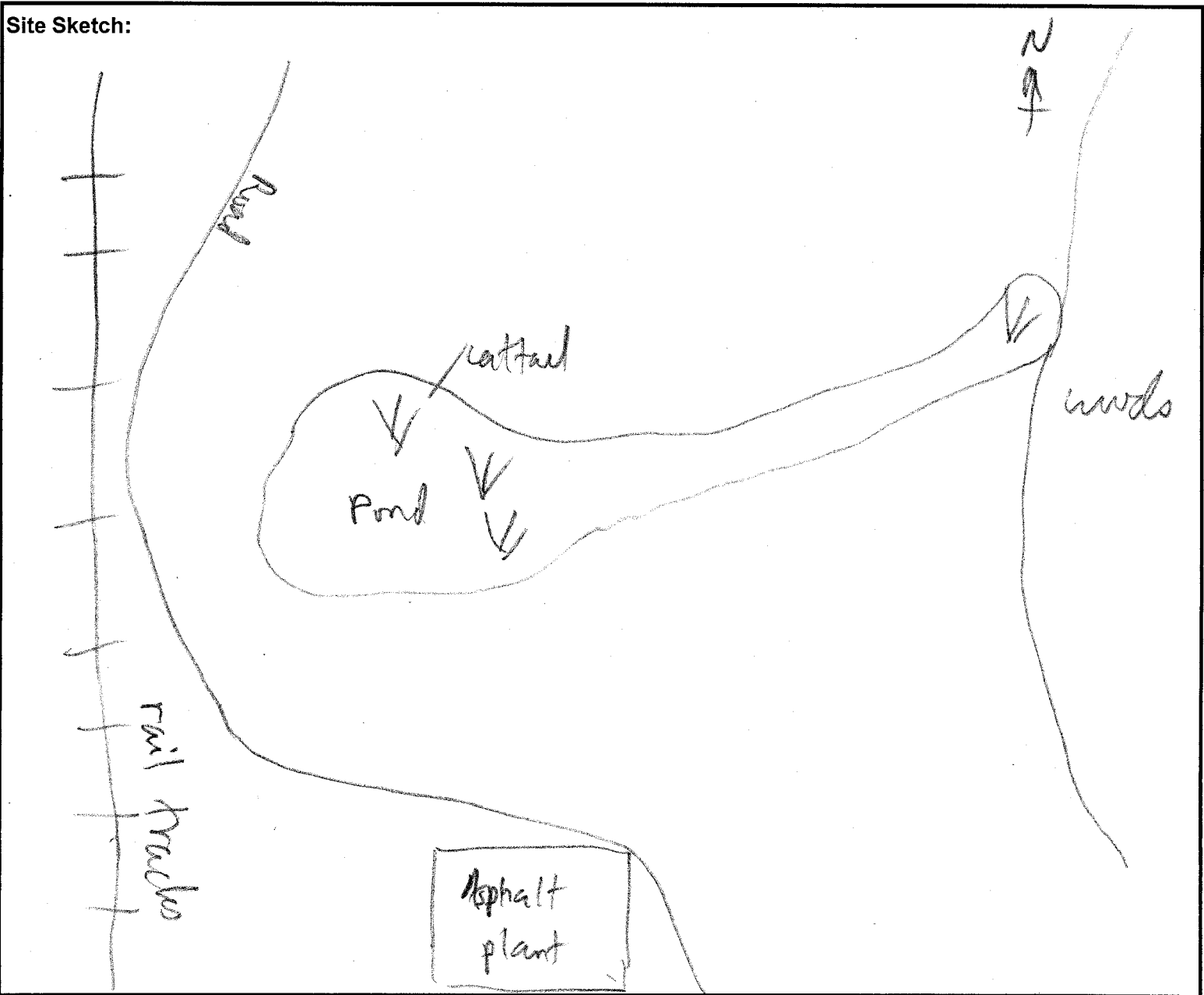
8

Project: \_\_\_\_\_

Date: \_\_\_\_\_

Field Crew: \_\_\_\_\_

Site Sketch:



Other Comments (details on fish habitat and fish species observed; include reference to photos):

No fish species observed; frogs; green frog, N. leopard frog  
Eastern garter snake  
Pollution sources: Asphalt plant runoff from road, machinery  
through wetland, quarry to east



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# WATER BODY ASSESSMENT

Project: Ernststam

Date: Aug 16, 2012

Field Crew: DCS

Water Body ID or description of location (if known) <u>WAFS (N. Pond)</u>	
Flow Regime (circle):	<input checked="" type="radio"/> Permanent <input type="radio"/> Intermittent
UTM Coordinates (NAD83):	<u>18T 0362111</u> easting <u>4899420</u> northing
Weather conditions in last 24 hours: <u>~29°C, clear, blue fort 1</u>	
Stream Velocity:	_____ m/s <input type="checkbox"/> estimated <input type="checkbox"/> measured (circle one)
<b>In-Stream Cover:</b>	
Cover Types Present (circle):	<input type="checkbox"/> undercut banks <input type="checkbox"/> deep pool <input type="checkbox"/> boulder <input type="checkbox"/> cobble
Total % Cover:	_____ <input type="checkbox"/> large organic debris <input type="checkbox"/> small organic debris <input type="checkbox"/> vegetation <input type="checkbox"/> other
Notes: _____	
<b>Bank Stability:</b>	
% eroding	_____ (bank angle > 45°, erodable soil, undercut banks or exposed soils)
% vulnerable	_____ (bank angle > 45°, no sign of recent erosion)
% protected	_____ (bank angle > 45°, non-erodable bank material)
% depositional	_____ (bank angle < 45°, fine grained sediments)
Bank Stability-Notes: _____	
<b>Substrate:</b> Record substrate composition as a percentage	
_____ Bedrock	<u>50</u> Silt
_____ Boulder	_____ Clay
_____ Cobble	_____ Muck
_____ Gravel	_____ Marl
<u>50</u> Sand	_____ Detritus
Substrate Notes: <u>Sand/Silt. only possible to determine at pond edge</u>	
<b>Stream Dimensions &amp; Morphology:</b>	
Stream Stage (circle one):	<input type="checkbox"/> Low Flow <input type="checkbox"/> Moderate Flow <input type="checkbox"/> High Flow <input type="checkbox"/> Dry <input type="checkbox"/> Stagnant
Stream Width at High Flow (m):	_____ estimated <input type="checkbox"/> measured (circle one)
Stream Wetted Width (m):	_____ estimated <input type="checkbox"/> measured (circle one)
Pool Depth at High Flow (cm):	_____ estimated <input type="checkbox"/> measured (circle one)
Pool Wetted Depth (cm):	_____ estimated <input type="checkbox"/> measured (circle one)
Channel morphology (% riffle/run/pool/flat throughout reach; straightened/channelized, meandering, braided channel): _____	
<b>Riparian Zone:</b>	
Riparian vegetation (≤ 5 meters of the stream):	<u>various upland species</u> <u>green Ash, prickly Ash, Milkweed, Am Elm</u>
Adjacent land use (≤ 50 meters of the stream):	<u>to N. soy field, to S/W/E, deciduous forest</u>
Canopy Cover:	% closed _____ % partly open _____ % open <u>100</u>
Water Chemistry:	pH <u>8.0</u> Turbidity <u>Algae - Heavy eutrophication</u> estimated <input type="checkbox"/> measured (circle one)
Temperature (°C):	<u>25</u> Conductivity: <u>171</u> Depth (at which chem. was taken) <u>5cm</u>
Fish Habitat:	Yes <input type="checkbox"/> <input checked="" type="radio"/> No (circle one)

isolated

# WATER BODY ASSESSMENT

Project: Ernesttown

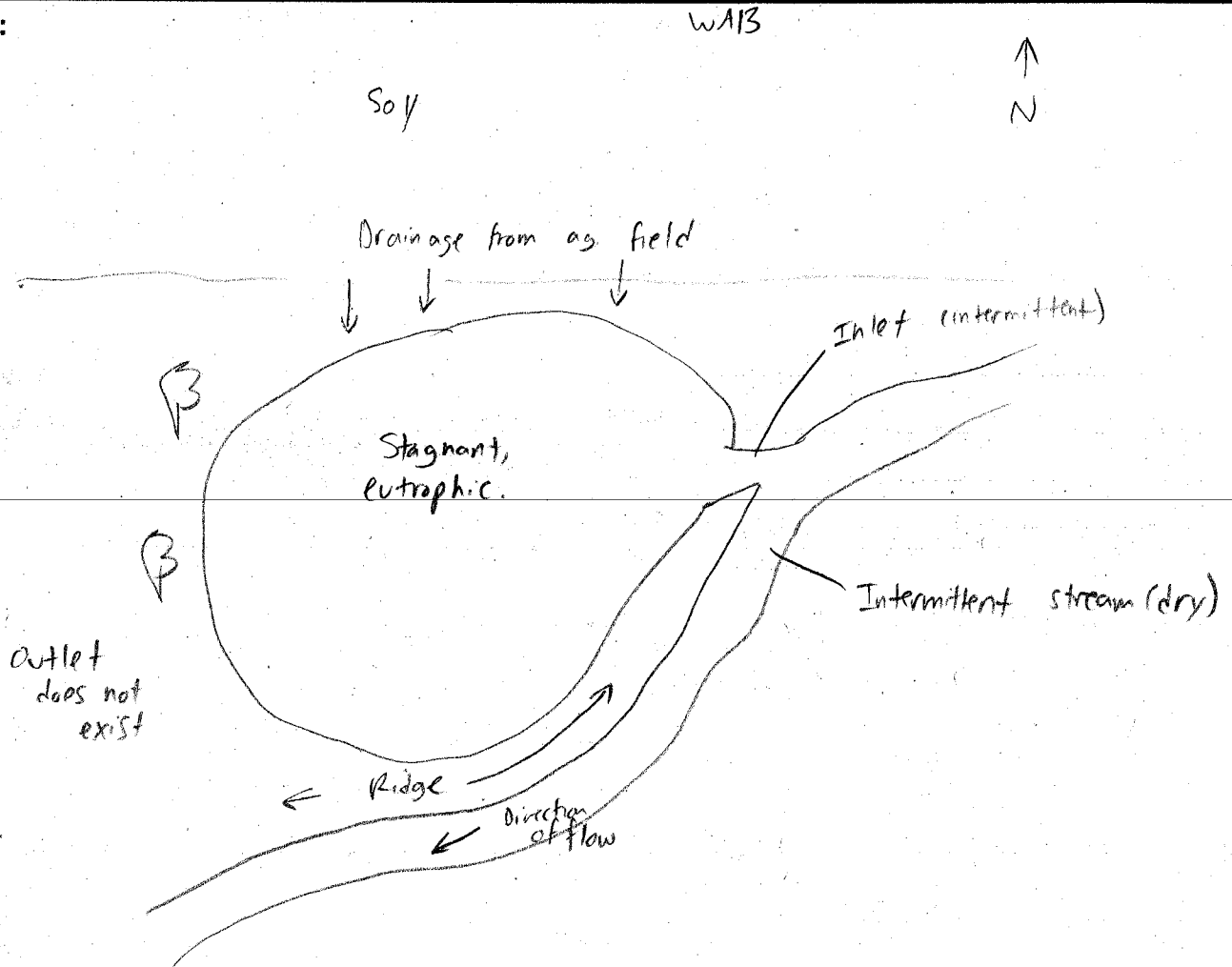
Date: 2012-08-18

Field Crew: DCS



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## Site Sketch:



## Other Comments (details on fish habitat and fish species observed; include reference to photos):

- No fish present
- Potential pollution sources: runoff from ag. fields
  - ↳ heavily polluted. Algae covers pond, no clear water visible





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# WATER BODY ASSESSMENT

Project: Ernestan

Date: 2012-08-16

Field Crew: DCS

Water Body ID or description of location (if known) SP302 (WA14)

Flow Regime (circle): Permanent Intermittent

UTM Coordinates (NAD83): 181 362799 easting 4898292 northing

Weather conditions in last 24 hours:  
~29°C, Breeze 0, TC: 1/10

Stream Velocity: N/A m/s estimated measured (circle one)

**In-Stream Cover:**  
Cover Types Present (circle): undercut banks deep pool boulder cobble  
Total % Cover: \_\_\_\_\_ large organic debris small organic debris vegetation other  
Notes: \_\_\_\_\_

**Bank Stability:**  
% eroding \_\_\_\_\_ (bank angle > 45°, erodable soil, undercut banks or exposed soils)  
% vulnerable \_\_\_\_\_ (bank angle > 45°, no sign of recent erosion)  
% protected \_\_\_\_\_ (bank angle > 45°, non-erodable bank material)  
% depositional \_\_\_\_\_ (bank angle < 45°, fine grained sediments)

Bank Stability Notes: \_\_\_\_\_

**Substrate:** Record substrate composition as a percentage  
\_\_\_\_\_ Bedrock 40 Silt Substrate Notes: \_\_\_\_\_  
\_\_\_\_\_ Boulder \_\_\_\_\_ Clay \_\_\_\_\_  
10 Cobble \_\_\_\_\_ Muck \_\_\_\_\_  
\_\_\_\_\_ Gravel \_\_\_\_\_ Marl \_\_\_\_\_  
50 Sand \_\_\_\_\_ Detritus \_\_\_\_\_

**Stream Dimensions & Morphology:**  
Stream Stage (circle one): Low Flow Moderate Flow High Flow Dry Stagnant  
Stream Width at High Flow (m): \_\_\_\_\_ estimated measured (circle one)  
Stream Wetted Width (m): \_\_\_\_\_ estimated measured (circle one)  
Pool Depth at High Flow (cm): \_\_\_\_\_ estimated measured (circle one)  
Pool Wetted Depth (cm): \_\_\_\_\_ estimated measured (circle one)  
Channel morphology (% riffle/run/pool/flat throughout reach; straightened/channelized, meandering, braided channel): \_\_\_\_\_

**Riparian Zone:**  
Riparian vegetation (≤ 5 meters of the stream): Arrowhead, Bugleweed, Puckweed, Water Plantain, Jewelweed  
Adjacent land use (≤ 50 meters of the stream): None - natural area

Canopy Cover: % closed \_\_\_\_\_ % partly open 100 % open \_\_\_\_\_

**Water Chemistry:** pH \_\_\_\_\_ Turbidity \_\_\_\_\_ estimated measured (circle one) DNA  
Temperature (°C): \_\_\_\_\_ Conductivity: \_\_\_\_\_ Depth (at which chem. was taken) \_\_\_\_\_

**Fish Habitat:** Yes No (circle one)



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# WATER BODY ASSESSMENT

Project: Ernestoban

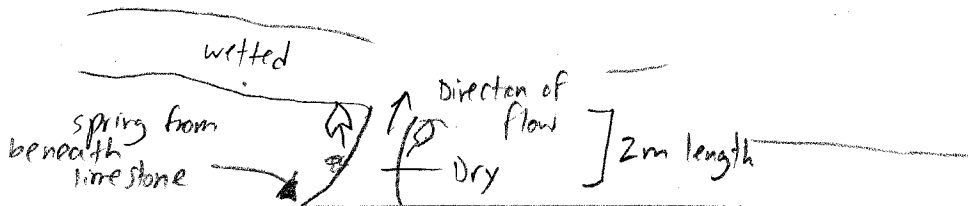
Date: 2012-08-16

Field Crew: DCS

**Site Sketch:**

Railroad tracks  
↑

Wetland  
(Marsh)



limestone shelf

coniferous slope

**Other Comments (details on fish habitat and fish species observed; include reference to photos):**

Potential pollution sources: runoff/sediments from railroad tracks

Fish habitat: Exists in adjacent wetland, possibly upstream during spring months



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# WATER BODY ASSESSMENT

Project: Errestawn

Date: 202-08-16

Field Crew: DS

Water Body ID or description of location (if known) SP302 (WA15)

Flow Regime (circle): Permanent 362898 Intermittent 4898289

UTM Coordinates (NAD83): 18T easting \_\_\_\_\_ northing \_\_\_\_\_

Weather conditions in last 24 hours:  
~29°C, Rainfall 0, r: 1/10

Stream Velocity: N/A m/s estimated measured (circle one)

**In-Stream Cover:**  
Cover Types Present (circle): ~~undercut banks~~ ~~deep pool~~ ~~boulder~~ ~~cobble~~  
Total % Cover: ~~large organic debris~~ ~~small organic debris~~ ~~vegetation~~ ~~other~~  
Notes: \_\_\_\_\_

**Bank Stability:**  
% eroding \_\_\_\_\_ (bank angle > 45°, erodable soil, undercut banks or exposed soils)  
% vulnerable \_\_\_\_\_ (bank angle > 45°, no sign of recent erosion)  
% protected \_\_\_\_\_ (bank angle > 45°, non-erodable bank material)  
% depositional \_\_\_\_\_ (bank angle < 45°, fine grained sediments)

Bank Stability Notes: \_\_\_\_\_

**Substrate:** Record substrate composition as a percentage  
\_\_\_\_\_ Bedrock 50 Silt Substrate Notes: \_\_\_\_\_  
\_\_\_\_\_ Boulder \_\_\_\_\_ Clay \_\_\_\_\_  
\_\_\_\_\_ Cobble \_\_\_\_\_ Muck \_\_\_\_\_  
\_\_\_\_\_ Gravel \_\_\_\_\_ Marl \_\_\_\_\_  
50 Sand \_\_\_\_\_ Detritus \_\_\_\_\_

**Stream Dimensions & Morphology:**  
Stream Stage (circle one): ~~Low Flow~~ ~~Moderate Flow~~ ~~High Flow~~ ~~Dry~~ ~~Stagnant~~  
Stream Width at High Flow (m): \_\_\_\_\_ estimated measured (circle one)  
Stream Wetted Width (m): \_\_\_\_\_ estimated measured (circle one)  
Pool Depth at High Flow (cm): \_\_\_\_\_ estimated measured (circle one)  
Pool Wetted Depth (cm): \_\_\_\_\_ estimated measured (circle one)  
Channel morphology (% riffle/run/pool/flat throughout reach; straightened/channelized, meandering, braided channel): \_\_\_\_\_

**Riparian Zone:**  
Riparian vegetation (≤ 5 meters of the stream): Arisead, Bugweed, Duckweed, water  
Plantain, Jewelweed  
Adjacent land use (≤ 50 meters of the stream): None - natural area

Canopy Cover: % closed \_\_\_\_\_ % partly open 100 % open \_\_\_\_\_

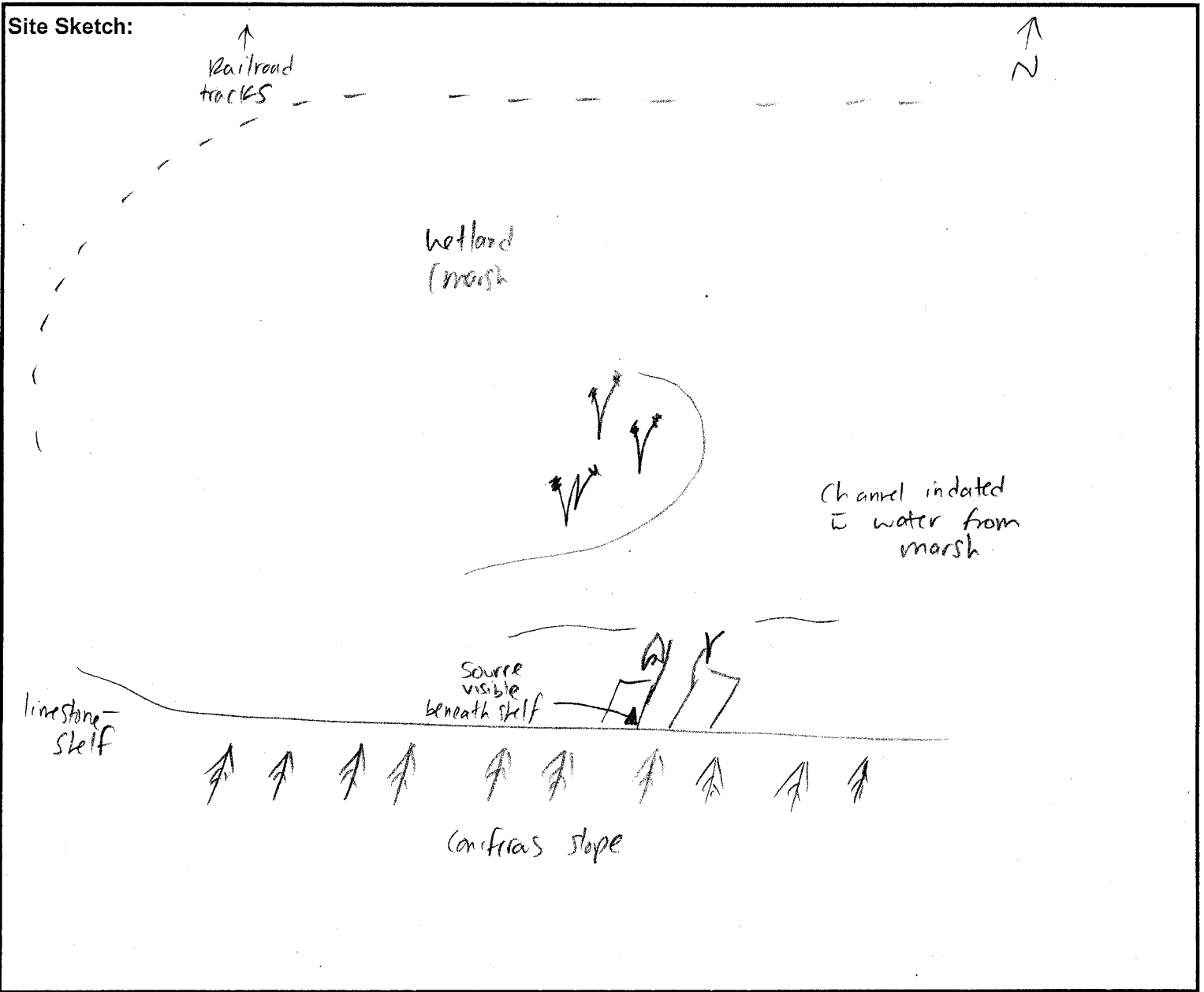
**Water Chemistry:** pH \_\_\_\_\_ Turbidity \_\_\_\_\_ estimated measured (circle one) DRY  
Temperature (°C): \_\_\_\_\_ Conductivity: \_\_\_\_\_ Depth (at which chem. was taken) \_\_\_\_\_

**Fish Habitat:** Yes No (circle one)



# WATER BODY ASSESSMENT

Project: Ernostown  
Date: 202-08-16  
Field Crew: DCS



Other Comments (details on fish habitat and fish species observed; include reference to photos):

Potential pollution sources: Runoff/sediments from railroad tracks.

Fish habitat: yes

Spring accepting flow from wetland - channel inundated with water from marsh

# **Ernestown Wind Park**

## *Water Bodies Impact Assessment Report*

DRAFT

Prepared by: *M.K. Ince and Associates Ltd.*

Prepared for: *Ernestown Wind Park Inc.*

September 14, 2012



**M.K. INCE AND ASSOCIATES LTD.**  
*Renewable Energy & Environmental Consulting*

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# 1 INTRODUCTION

Ernestown Wind Park Inc. proposes to build a wind park, with a nameplate capacity of 10 MW for privately-owned agricultural lands within Loyalist Township, Lennox-Addington County, Ontario (see **Figure 2-1**). The project will be known as the Ernestown Wind Park and would consist of five (5) wind electric generators and would be rated as a Class 4 wind energy facility. The proponent has received a contract from the Ontario Power Authority for the purchase of electricity generated by the wind turbines at this renewable facility through the Province's Feed-In-Tariff Program. The project is subject to the Renewable Energy Approval (REA) process per *Ontario Regulation 359/09* under Section V.0.1 of the *Environmental Protection Act*.

This *Water Bodies Impact Assessment Report* is one of the component pieces of the REA application. The Ministry of Environment (MOE) checklist for completion of the WBIAR summarizes the regulatory requirements for this report and describes how those requirements have been met. This checklist is shown in **Table 1-1** below.

**Table 1-1:** Checklist for the Water Bodies Impact Assessment Report

<b>Water Bodies Impact Assessment</b>		
<b>REQUIRED DOCUMENTATION</b>	<b>REQUIREMENT MET</b>	<b>LOCATION IN SUBMISSION</b>
39. (1) No person shall construct, install or expand a renewable energy generation facility as part of a renewable energy project in a project location that is in any of the following locations: 1. A lake or within 30 metres of the average annual high water mark of a lake. 2. A permanent or intermittent stream or within 30 metres of the average annual high water mark of a permanent or intermittent stream. 3. A seepage area or within 30 metres of a seepage area. (2) Subsection (1) does not apply if ... the applicant submits a report that,		
(a) identifies and assesses any negative environmental effects of the project on a water body referred to above and on land within 30 metres of the water body;	Yes	<b>Section 2, Section 3, Table 3-1</b>
(b) identifies mitigation measures in respect of any negative environmental effects mentioned above;	Yes	<b>Table 3-1 and Section 3</b>
(c) describes how the environmental effects monitoring plan addresses any negative environmental effects mentioned above;	Yes	<b>Section 3</b>
(d) describes how the construction plan report addresses any negative environmental effects mentioned above.	Yes	<b>Section 3, Section 4</b>
40. (1) No person shall construct, install or expand a renewable energy generation facility as part of a renewable energy project at a project location that is in any of the following locations: 1. Within 120 metres of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity. 2. Within 300 metres of the average annual high water mark of a lake trout lake that is at or above development capacity. 3. Within 120 metres of the average annual high water mark of a permanent or intermittent stream. 4. Within 120 metres of a seepage area. (2) Subsection (1) does not apply if ... the applicant submits a report that,		

(a) identifies and assesses any negative environmental effects of the project on a water body referred to above and on land within 30 metres of the water body;	Yes	<b>Section 2, Section 3, Table 3-1</b>
(b) identifies mitigation measures in respect of any negative environmental effects mentioned above;	Yes	<b>Table 3-1 and Section 3</b>
(c) describes how the environmental effects monitoring plan addresses any negative environmental effects mentioned above;	Yes	<b>Section 3</b>
(d) describes how the construction plan report addresses any negative environmental effects mentioned above.	Yes	<b>Section 3</b>

The mitigation measures presented in this *Water Bodies Impact Assessment Report* are applicable to all employees and contractors of Ernestown Wind Park. It provides guidance to contractors and subcontractors on environmentally safe standards during all phases of project activity. Additionally, this report provides information on environmental monitoring of the project to meet performance objectives (see **Table 3-1**).

Please refer to the *Project Description Report* for a complete description of the Project infrastructure being evaluated under the REA process and to the *Water Assessment Report* for a description of the water bodies referred to in this report.

Mitigation and monitoring measures outlined in the *Environmental Effects Monitoring Plan* in the *Design and Operations Report*, and in the *Construction Plan Report*, are referred to in **Section 3** of this report.



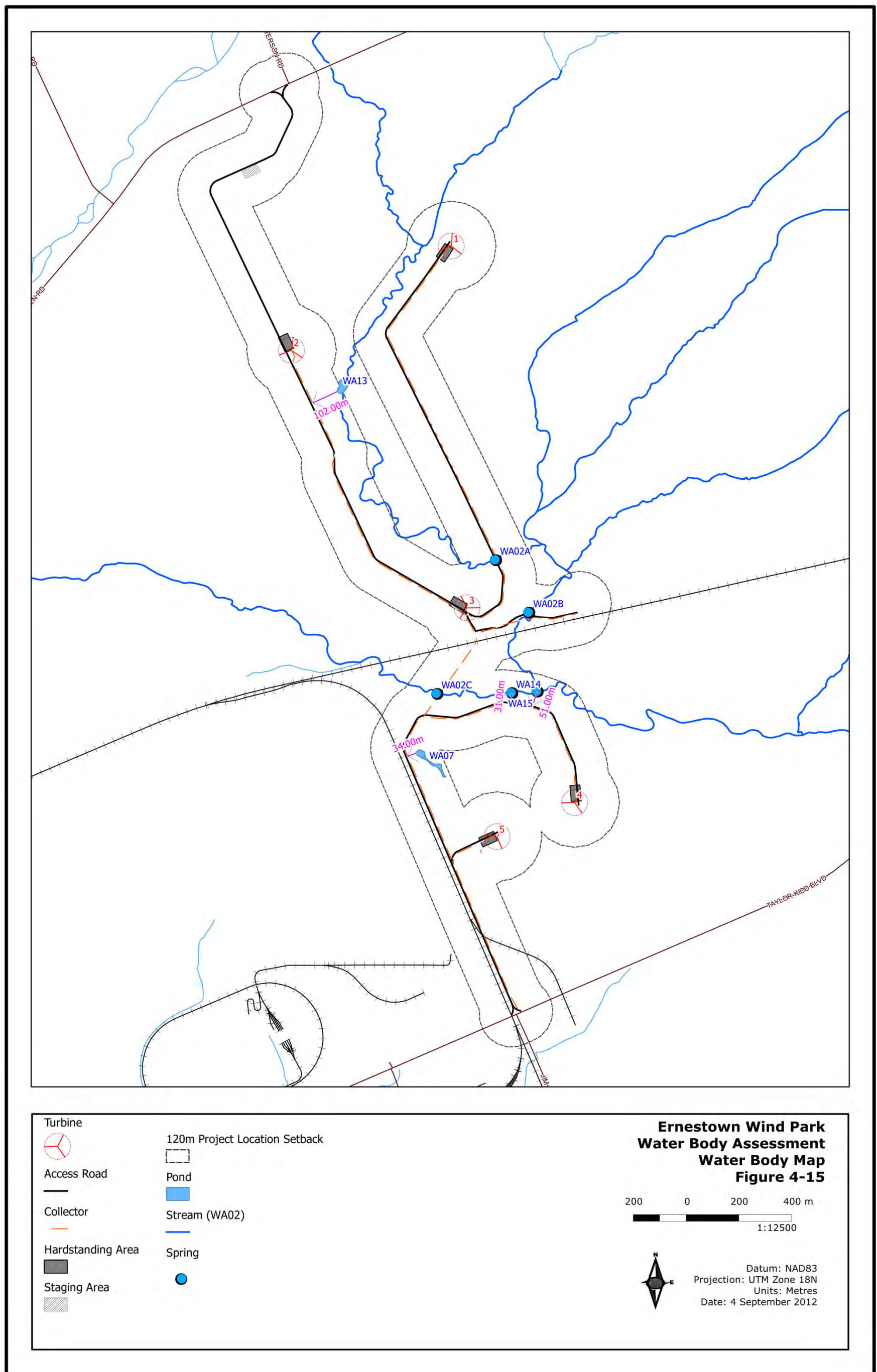


Figure 1-1: Ernestown Water Body Map

## 2 WATER BODIES

The *Ernestown Water Assessment Report* summarizes the findings of a Records Review and Site Investigation for water bodies within 120 m of the Ernestown Wind Park Project Location. Results from the *Water Assessment Report* indicate that five water bodies exist within 120 m from the proposed Project infrastructure (**Figure 1-1**). The following features were identified to exist within 120 m of the Project Location:

1. WA02 – permanent stream to be crossed at three locations by access roads and overhead electrical collector lines
2. WA07 – natural pond/shallow marsh
3. WA13 – natural pond
4. WA14 – spring
5. WA15 – spring

These five water bodies are further described below in **Table 3-1**. The location of these water bodies in relation to project infrastructure is also presented within **Table 3-1** and in **Figure 1-1**. For a full description of the water bodies and their assessment, please refer to the *Ernestown Water Assessment Report* (M.K. Ince and Associates Ltd., 2012).

### 3 POTENTIAL ENVIRONMENTAL EFFECTS

An assessment of all potential negative environmental effects on water bodies within the Ernestown Wind Park location is provided in **Table 3-1**. The table describes the spatial, temporal, magnitude, frequency and duration of the effects, as well as, any effect on size, diversity, health, connectivity and functionality of water bodies. Mitigation measures were developed to prevent negative environmental effects and to maintain the form and function of water bodies.

Where access roads and cabling will cross water bodies, the Department of Fisheries and Oceans (DFO) *Operational Statement for Overhead Line Construction* will be adhered to and *Isolated Stream Crossing* will be integrated into construction plans where appropriate (see **Appendix A**). Additional communication and coordination of stream crossing construction and decommissioning will occur with the Cataraqui Region Conservation Authority and the DFO to ensure that all project activities meet regulations.

The mitigation for the Ernestown Wind Park emphasizes the preservation of natural vegetation and the water bodies themselves. This is achieved by the installation of silt fencing along the perimeters of features, minimizing disturbance to non-construction areas, and adherence to construction plans. The installation of silt fences around construction areas or features will prevent encroachment, siltation and or erosion within water bodies and will provide an obvious border to areas that should be avoided by workers. It is anticipated that the mitigation measures proposed within **Table 3-1** will fully mitigate for all negative environmental effects.

**Table 3-1:** Potential environmental impact, mitigation measures and performance objectives for water bodies identified within the Project location

Natural Feature ID	Distance to Project Components within 120 m	Project Phase and Activity within 120 m of Natural Feature	Potential Negative/Positive Effect(s)		Performance Objective	Mitigation Measures	Residual Effects
			Physical	Functional			
WA02 Stream	Collector (0 m); Access Road (0 m)	Construction/ decommissioning of access road and overhead collector line; use of access road for maintenance	<p><u>Construction/ Decommissioning:</u> Encroachment onto feature due to road and collector line construction/ decommissioning will be kept to a minimum; destruction of fish habitat will be minimal. Potential fragmentation of fish habitat.</p> <p>Potential for small edge effect (colonization on water body borders, pollution, erosion, loss of habitat) given encroachment onto feature</p> <p>Potential for erosion and/or sedimentation from construction activities, but these impacts will be short term and highly localized.</p> <p>Minimal risk of contamination to soils from spills and leaks anticipated.</p> <p>Changes in water temperature due to vegetation removal in riparian zone.</p>	Displacement of wildlife using WA02 due to construction noise (temporary) and encroachment onto feature.	<p>Minimize changes to form of water body (i.e. minimal encroachment).</p> <p>Riparian zone of the water body is restored or enhanced through revegetation with native species after construction.</p> <p>Ensure any erosion and sedimentation impacts do not affect overall water quality.</p> <p>Avoid or contain all leaks and spills.</p> <p>Minimize impacts of land clearing.</p>	<p>Adherence to Department of Fisheries and Oceans' (DFO) <i>Ontario Operation Statement: Overhead Line Construction</i> and reference to <i>Operation Statement: Isolated Stream Crossing</i>.</p> <p>Areas for construction will be demarcated. All workers will be notified of water body. Daily visual monitoring of work area to ensure compliance (construction only occurring within demarcated area).</p> <p>Construction of stream crossing to take place when the stream bed is dry if possible.</p> <p>Adherence to de-watering methods according to DFO <i>Operation Statement for Isolated Stream Crossing</i> if method deemed appropriate by Cataraqui Region Conservation Authority and DFO.</p> <p>Entire disturbed riparian area will be re-vegetated with native species following the completion of any construction/decommissioning activities.</p> <p>Silt barriers (e.g. fencing) will be erected along the edge of the water body boundary. Erosion and sediment fencing will be maintained and monitored, especially after a rain event and until vegetation has become established.</p> <p>Ensure all equipment used on site is in good working order. Ensure safe storage of petroleum, oils and lubricants. Where possible, vehicle maintenance will be performed off site, at a nearby commercial fuelling station, in order to minimize the amount of lubricants and oils stored on site. Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.</p> <p>In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately. Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.</p>	<p>Type of construction should have limited impact.</p> <p>No residual effects anticipated given that mitigation measures should prevent any potential negative effect to feature.</p>
			<p><u>Operation:</u> Use of road salt during winter months may increase salinity of WA02.</p>	Indirect effects from operation (i.e. noise) could temporarily disturb wildlife living in this habitat.			

Natural Feature ID	Distance to Project Components within 120 m	Project Phase and Activity within 120 m of Natural Feature	Potential Negative/Positive Effect(s)		Performance Objective	Mitigation Measures	Residual Effects
			Physical	Functional			
WA07 Natural pond/ shallow marsh	Collector (34 m); Access Road (34 m)	Construction/ decommissioning of access road and overhead collector line; use of access road for maintenance	<u>Construction/ Decommissioning:</u> No encroachment onto feature.  Distance between the feature and any construction/ decommissioning activity exceeds the 30 m minimum buffer to protect the water body from any negative environmental impacts. In particular, since there will be no encroachment on the feature and the access road and collector line is a substantial distance away, no impacts to the form and function of the water body.	Displacement of wildlife using WA07 due to construction noise (temporary) and encroachment onto feature.	Ensure no encroachment into feature or 30 m buffer.	Areas for construction will be demarcated. All workers will be notified of water body. Daily visual monitoring of work area to ensure compliance (construction only occurring within demarcated area).  Ensure all equipment used on site is in good working order. Ensure safe storage of petroleum, oils and lubricants. Where possible, vehicle maintenance will be performed off site, at a nearby commercial fuelling station, in order to minimize the amount of lubricants and oils stored on site. Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.  In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately. Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.	No residual effects anticipated.
			<u>Operation:</u>  Use of road salt during winter months may increase salinity of WA07.	Indirect effects from operation (i.e. noise) could temporarily disturb wildlife living in this habitat.			
WA13 Natural pond	Collector (102 m); Access Road (102 m)	Construction/ decommissioning of access road and overhead collector line; use of access road for maintenance	<u>Construction/ Decommissioning:</u> No encroachment onto feature.  Distance between the feature and any construction/ decommissioning activity exceeds the 30 m minimum buffer to protect the water body from any negative environmental impacts. In particular, since there will be no encroachment on the feature and the access road and collector line is a substantial distance away, no impacts to the form and function of the water body.	Displacement of wildlife using WA13 due to construction noise (temporary) and encroachment onto feature.	Ensure no encroachment into feature or 30 m buffer.	Areas for construction will be demarcated. All workers will be notified of water body. Daily visual monitoring of work area to ensure compliance (construction only occurring within demarcated area).  Ensure all equipment used on site is in good working order. Ensure safe storage of petroleum, oils and lubricants. Where possible, vehicle maintenance will be performed off site, at a nearby commercial fuelling station, in order to minimize the amount of lubricants and oils stored on site. Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.  In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately. Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.	No residual effects anticipated.
			<u>Operation:</u>  Use of road salt during winter months may increase salinity of WA13.	Indirect effects from operation (i.e. noise) could temporarily disturb wildlife living in this habitat.			

Natural Feature ID	Distance to Project Components within 120 m	Project Phase and Activity within 120 m of Natural Feature	Potential Negative/Positive Effect(s)		Performance Objective	Mitigation Measures	Residual Effects
			Physical	Functional			
WA14 Spring	Collector (31 m); Access Road (31 m)	Construction/ decommissioning of access road and overhead collector line; use of access road for maintenance	<u>Construction/ Decommissioning:</u> No encroachment onto feature.  Distance between the feature and any construction/ decommissioning activity exceeds the 30 m minimum buffer to protect the water body from any negative environmental impacts. In particular, since there will be no encroachment on the feature and the access road and collector line is a substantial distance away, no impacts to the form and function of the water body.	Displacement of wildlife using WA14 due to construction noise (temporary) and encroachment onto feature.	Ensure no encroachment into feature or 30 m buffer.	Areas for construction will be demarcated. All workers will be notified of water body. Daily visual monitoring of work area to ensure compliance (construction only occurring within demarcated area).  Ensure all equipment used on site is in good working order. Ensure safe storage of petroleum, oils and lubricants. Where possible, vehicle maintenance will be performed off site, at a nearby commercial fuelling station, in order to minimize the amount of lubricants and oils stored on site. Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.  In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately. Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.	No residual effects anticipated.
			<u>Operation:</u>  Use of road salt during winter months may increase salinity of WA14.	Indirect effects from operation (i.e. noise) could temporarily disturb wildlife living in this habitat.			
WA15 Spring	Collector (51 m); Access Road (51 m)	Construction/ decommissioning of access road and overhead collector line; use of access road for maintenance	<u>Construction/ Decommissioning:</u> No encroachment onto feature.  Distance between the feature and any construction/ decommissioning activity exceeds the 30 m minimum buffer to protect the water body from any negative environmental impacts. In particular, since there will be no encroachment on the feature and the access road and collector line is a substantial distance away, no impacts to the form and function of the water body.	Displacement of wildlife using WA15 due to construction noise (temporary) and encroachment onto feature.	Ensure no encroachment into feature or 30 m buffer.	Areas for construction will be demarcated. All workers will be notified of water body. Daily visual monitoring of work area to ensure compliance (construction only occurring within demarcated area).  Ensure all equipment used on site is in good working order. Ensure safe storage of petroleum, oils and lubricants. Where possible, vehicle maintenance will be performed off site, at a nearby commercial fuelling station, in order to minimize the amount of lubricants and oils stored on site. Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.  In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately. Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.	No residual effects anticipated.
			<u>Operation:</u>  Use of road salt during winter months may increase salinity of WA15.	Indirect effects from operation (i.e. noise) could temporarily disturb wildlife living in this habitat.			

## 4 ENVIRONMENTAL EFFECTS MONITORING PLAN

As discussed in the *Design and Operations Report*, environmental effects monitoring is proposed in respect to any negative environmental effects that may result from the development of Ernestown Wind Park project. As per the REA regulation, the monitoring plan identified:

- performance objectives in respect to the identified negative environmental effects;
- all mitigation measures planned to achieve performance objectives;
- how the project will be monitored to ensure that mitigation strategies are meeting performance objectives to assist in achieving the performance objects; and
- contingency measures to be implemented should monitoring reveal that mitigation measures have failed.

For the purposes of this *Environmental Impact Study Report*, specific mitigation and monitoring measures for potential environmental impacts are addressed below in **Section 4.1**. The mitigation and associated monitoring measures are relevant to the significant natural features which can be seen above in **Table 3-1**. Information presented below will serve to verify that mitigation measures are functioning in order to meet performance objectives. If performance objectives are not being met, as indicated by monitoring, contingency measures will be used to ensure that remedial action is taken to comply with identified performance objectives.

### 4.1 Detailed Environmental Effects

The sections below provide detailed information on the specific environmental effects that have been outlined above in **Table 3-1**. The environmental effects discussed below are also discussed in the *Design and Operations Report* and pertain specifically to the water bodies at the proposed Ernestown Wind Park.

#### 4.1.1 Spills and Leaks

##### *Potential Effects*

The potential exists for the uncontrolled release of petroleum, oils and lubricants (POLs) due to accidental spillage or leakages. This would lead to adverse effects on terrestrial, aquatic and marine habitat and species, soil, groundwater quality and human health and safety.

##### *Objectives*

Prevent or contain all leaks and spills from POLs during construction, operation or decommissioning.

##### *Mitigation Measures*

The following protection measures are intended to minimize the potential for any petroleum, oil and lubricants (POLs) spills on soil, vegetation, surface water, and groundwater.

### Storage and disposal of POLs:

- The transportation of POLs will be conducted in compliance with the *Transportation of Dangerous Goods Act*.
- There will be no on-site storage of POLs for fueling or vehicle maintenance purposes.
- Where possible, vehicle maintenance will be performed off site, at a nearby commercial fuelling station, in order to minimize the amount of lubricants and oils stored on site.
- POLs will be stored in compliance with applicable provincial and federal regulations, codes and guidelines. During maintenance, POLs will be stored within the base of the tower for the duration of each visit and as such will be well-removed from any water bodies or wetlands. Upon completion of turbine maintenance activities, all POLs will be removed from the site.
- On-site POL storage will be in a ventilated, lockable steel container. The container will be equipped with galvanized steel drip trays for the collection of spilled substances.
- The on-site POL storage container shall be located on level terrain, at least 120 m from any water body, watercourse or wetland.
- Spill decks will be used for transferring products to smaller containers.
- Fire extinguishers will be located near POL storage areas.
- A spill kit, including absorbent material, will either be stored in the base of the tower or will be brought to the site during maintenance visits.
- POL storage areas will be identified by signs.
- Smoking will not be permitted within 50 m of any POL storage area. “No Smoking” signs will be displayed at all POL storage sites and refuelling areas. On-site signage will indicate the location of smoking areas.

### Equipment Fuelling:

Only equipment that is not easily transported will be refueled on site. All other vehicles and equipment will be refueled at a commercial fuelling station.

- When refuelling equipment, operators will:
  - use designated fuelling locations;
  - use drips trays;
  - use leak free containers and reinforced rip and puncture proof hoses and nozzles;
  - be in attendance for the duration of the procedure; and
  - seal all storage container outlets except the outlet currently in use.
- Fuelling must be done at least 120 m from water bodies.
- The Contractor will make daily inspections of hydraulic and fuel systems on machinery and leaks will be repaired immediately. All leaks will be reported to the MOE, Spills Action Centre at 1-800-268-6060.
- Servicing of equipment will not be allowed within 120 m of a wetland, watercourse or water body.
- Fuelling attendants will be trained in the requirements under the contingency response plan below.

### POL Waste Disposal



- Waste POLs will be stored in a ventilated, lockable steel container. The container will be equipped with galvanized steel drip trays for the collection of spilled substances.
- Waste solvents and oils will be stored separately.
- All used oil and petroleum products will be removed as required and disposed in an acceptable manner in accordance with government regulations, and requirements, including but not limited to *O. Reg 347/09 S. 17.2*. Waste oil will be collected separately and offered for recycling or stored for collection by an appropriate special waste collection and disposal company.
- Greasy or oily rags or materials subject to spontaneous combustion will be deposited, and kept, in an appropriate receptacle. This material will be removed from the work site on a regular basis and will be disposed in an approved existing waste disposal facility.
- POL waste disposal will be the responsibility of the Contractor.

### Servicing and Inspections

- Regular scheduled inspections of oil and hydraulic systems will be made during the semi-annual maintenance visits, and any leaks found will be repaired immediately. All leaks will be reported to the Ontario Ministry of Environment, Spills Action Centre at 1-800-268-6060. As turbine systems will be monitored remotely by cell phone or satellite communication, technicians will determine when additional unscheduled inspections are required. These are typically performed every 2 to 3 months at each turbine.
- Equipment will not be serviced within 120 m of water bodies.

### Emergency Response

Even with the implementation of the above mitigation measures, there is a possibility of accidents resulting in the release of hazardous materials into the environment. In the event that a spill occurs, action will be taken as outlined in the contingency measures below.

#### ***Monitoring Plan and Contingency Measures***

If it is safe to do so, the individual who discovers the leak or spill will immediately attempt to stop and contain the leak or spill.

Any spill or leak must be reported immediately to the Construction or Operations Manager.

The Construction or Operations Manager will immediately report the spill to the Ontario Ministry of Environment, Spills Action Centre which can be reached at 1-800-268-6060. A Spill Report Form shall be filled out and will include:

- a description of the source, including the name of the owner or operator;
- the nature, extent, duration and environmental impact of the release;
- the cause or suspected cause of the release; and
- any remedial action taken or to be taken to prevent a recurrence of the leak or spill.

The site Contractor will have the full authority to take appropriate action without unnecessary delay. The Spill Report Form in will be filled out by the Contractor immediately following the discovery of the spill or leak and forwarded to the Project Manager.

The Contractor will assume the overall responsibility for coordinating the clean-up and maintaining this contingency plan current and up-to-date. The Contractor will, in consultation with the regulatory authorities (if warranted):

- deploy on-site personnel to contain the spilled material using a dyke, pit, or absorbent material;
- assess site conditions and environmental impact of various cleanup procedures;
- choose and implement an appropriate cleanup procedure;
- deploy on-site personnel to mobilize pumps and empty drums (or other appropriate storage) to the spill site;
- dispose of all contaminated debris, cleaning materials, and absorbents by placing in an approved disposal site.

#### Spill Cleanup Resource List:

Throughout the operational life of the project, the following resources will be available at an appropriate location in readiness to respond to accidental releases of fuels and/or hazardous materials:

- Absorbent materials (e.g. sorbent pads, Sorb-All, peat moss).
- Small equipment such as shovels, rakes, tool kit, sledgehammer, buckets, stakes, tarpaulins, one empty drum, and protective equipment.

### **4.1.2 Impacts due to Erosion and Sedimentation**

#### *Potential Effects*

Due to the clearing, grading, excavating and potential soil and root compaction during construction, major maintenance activities and decommissioning, stormwater patterns may change. This may increase erosion and concomitant impacts to nearby water bodies, including reduced water quality, sedimentation, and impacts to aquatic organisms and habitat. The construction works associated with water body crossings have the potential to further contribute to the potential effects.

#### *Objectives*

To ensure erosion control measures employed during construction and decommissioning are effective at the time of major works and remain effective until permanent restorative measures effectively eliminate impacts due to erosion and sedimentation.

#### *Mitigation Measures*

Where access roads and cabling will cross water bodies, the Department of Fisheries and Oceans (DFO) *Operational Statement for Overhead Line Construction* will be adhered to and *Isolated Stream Crossing* will be integrated into construction plans where appropriate (see **Appendix A**).

Where grading, excavation, drilling, soil stockpiling or vegetation clearing is to occur within 120 m of water bodies, siltation fences will be installed in order to prevent movement of sediment toward water bodies. Where necessary, ditches and catchment areas will be established to supplement the siltation fences. These ditches will be routed away from nearby water bodies and terminate in locations such that no sediment will be able to enter water bodies. Areas with temporarily cleared vegetation will have native

plants replanted to permanently effect erosion control. Temporarily stockpiled soil will also be covered with geotextile in order to further prevent erosion. Upon the completion of backfilling and the subsequent disposition of excess soil elsewhere within the properties by the property owners (outside of 120 m from the water bodies), replanting with native vegetation will be undertaken in areas that are not going to be used for agricultural purposes. For excavation within municipal road easements, following backfilling reconditioning of the surface will be undertaken, with gravel, asphalt or native plants and grasses as appropriate.

### ***Monitoring Plan and Contingency Measures***

Captured sediment will be removed and deposited 120 m away from aquatic features as necessary. Damaged sediment control features will be immediately repaired.

One year after construction a survey will be undertaken to ensure that long-term erosion control measures have been effective. This will include an inspection of drainage facilities such as ditches, culverts and water retention areas for structural integrity and any excessive amount of silt collection. Seeded or replanted areas will be inspected to ensure that re-vegetation measures were successful and re-seeding or replanting will occur where necessary.

If erosion control measures are found to be less than fully effective during this survey, reseeding or replanting of problem areas will take place. Should there be residual effects noted during post-construction monitoring, advice on contingency measures will be sought out and applied.

## **4.1.3 Impacts to Fish and Fish Habitat**

### ***Potential Effects***

Impacts to fish and fish habitat are possible from the activities associated with the construction of water body crossings. Fish and fish habitat have the potential to be harmed by spills and leaks, and erosion and sedimentation, from various construction activities. Additional potential impacts specific to the construction of water crossings include disturbance to riparian vegetation and disturbance of the banks and streambed during the construction process, all of which could result in disturbance or damage to fish or fish habitat.

### ***Objectives***

To avoid any harmful alteration, disruption or destruction (HADD) of fish habitat.

### ***Mitigation Measures***

Where access roads and cabling will cross water bodies, the Department of Fisheries and Oceans (DFO) *Operational Statement for Overhead Line Construction* will be adhered to and *Isolated Stream Crossing* will be integrated into construction plans where appropriate (see **Appendix A**). Measures to be implemented are described below.

The measures listed below are numbered identically to the *Overhead Line Construction Operational Statement*; please refer to the Operational Statement for a comparison between the DFO recommended measures and how the measures are being implemented as shown below.

1. Installing overhead lines under frozen conditions is preferable in all situations. On wet terrains lines should be installed under frozen conditions, where possible, or using aerial methods.
2. Design and construct approaches so that they are perpendicular to the watercourse where possible to minimize loss or disturbances to vegetation.
3. Avoid building structure on meander bends, braided streams, alluvial fans, active floodplains or any other area that is inherently unstable and may result in erosion and scouring of the stream bed or overhead line structures.
  - i) Wherever possible, locate all temporary or permanent structures, such as poles, sufficiently above the high water mark to prevent erosion.
4. The removal of select plants may be necessary to accommodate the overhead line. This removal should be kept to a minimum and within the road or utility right of way.
5. Machinery fording the watercourses to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and should occur only if an existing crossing at another location is not available or practical to use.
  - i) If minor rutting is likely to occur, stream bank and bed protection methods (e.g. swamp mats, pads) should be used provided they do not constrict flows and block fish passage.
  - ii) Grading of the stream banks for the approach should not occur.
  - iii) If the stream bed and banks are steep and highly erodible (i.e., dominated by organic materials and silts) and erosion and degradation is likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.
  - iv) Time the one-time fording to prevent disruption to the sensitive fish life cycle by adhering to appropriate fisheries windows.
  - v) Fording should not occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.
6. Operate machinery on land and in a manner that minimizes disturbance to the banks of the watercourse.
  - i) Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.
  - ii) Wash, refuel and service machinery and store fuel and other material for the service machinery away from the water to prevent any deleterious substance from entering the water.
  - iii) Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
  - iv) Restore banks to original condition if any disturbance occurs.
7. Install effective sediment and erosion control measure before starting work to prevent entry of sediment into the watercourse. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.
  - i) Avoid work during wet, rainy conditions or use alternative techniques such as aerial methods to install overhead lines.
8. Stabilize any waste materials removed from the work site to prevent them from entering the watercourse. This could include covering soil piles with biodegradable mats or tarps or planting them with grass or shrubs.
9. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent erosion and to help germinate seeds. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g. Cover exposed

areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.

- i) Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

The measures outlined in the *Isolated Stream Crossing Operational Statement (Appendix A)* will be integrated into construction plans where appropriate. Additional communication and coordination of stream crossing construction and decommissioning will occur with the Cataraqui Region Conservation Authority and the DFO to ensure that all project activities meet regulations.

### ***Monitoring Plan and Contingency Measures***

During construction, the areas subject to modification will be continually monitored for negative environmental impacts.

Operators will monitor the construction area to ensure no contamination of area.

## **5 RESIDUAL EFFECTS**

It is anticipated that implementation of the mitigation and monitoring measures described above, in addition to those included in the *Construction Plan Report* and *Design and Operations Report* (which includes the *Environmental Effects Monitoring Plan*), will address all potential environmental effects. Consequently, there are no residual effects anticipated.

## **6 CONCLUSION**

A total of five water bodies were either identified and/or confirmed during the Records Review and subsequent Site Investigations to exist within the 120 m REA setback. These findings are reported in the accompanying Ernestown Wind Park *Water Assessment Report*. These five water bodies were carried forward to this *Water Bodies Impact Assessment Report*. Each water body was evaluated for potential environmental effects due to activities associated with the Ernestown Wind Park.

Based on the evaluation, there are five water bodies where potential environmental effects exist. These effects are anticipated to be highly localized and short-term. Mitigation measures are presented above (**Table 3-1**) and there are no residual effects anticipated.

Based on the assessments conducted, the following potential environmental effects were identified for access road and overhead electrical crossings of water bodies in Project location:

- erosion and sedimentation;
- potential for contamination of soil or water resulting from the improper storage or handling of hazardous materials leading to spills or leaks;
- effects on fish and/or fish habitat,

- After the implementation of the mitigation measures contained in this report, in addition to the *Construction Plan Report* and *Design and Operations Report* (which includes the *Environmental Effects Monitoring Plan*), no significant net effects on the identified water bodies are anticipated.

## 7 QUALIFICATIONS AND LIMITATIONS

M. K. Ince & Associates Ltd. has prepared this report in accordance with the applicable REA requirements and technical guidance documents issued by the MOE. The information and analysis contained herein is for the sole benefit of Ernestown Wind Park and save for regulatory review purposes may not be relied upon by any other person.

The contents of this report are based upon our understanding of guidelines and regulations which we believe to be current at this time. Subsequent changes in guidelines, regulations, and enforcement policies can occur at any time, and such changes could affect the conclusions and recommendations of this report.

While we have referred to and made use of reports and specifications prepared by others, we assume no liability for the accuracy of the information contained within those reports and specifications.

## 8 REFERENCES

- First Base Solutions. 2006. Orthophotograph of Project Location and surrounding area. Photo dated Spring 2006.
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- Ontario Ministry of Natural Resources (MNR). 2010c. *Land Information Ontario*. Available at: [www.mnr.gov.on.ca/en/Business/LIO/index.html](http://www.mnr.gov.on.ca/en/Business/LIO/index.html) [accessed July 4, 2012]
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## **APPENDIX A – OPERATIONAL STATEMENTS**



# OVERHEAD LINE CONSTRUCTION

Fisheries and Oceans Canada  
Ontario Operational Statement

Version 3.0

Overhead lines are constructed for electrical or telecommunication transmission across many watercourses that range in size from small streams and ponds to large rivers, lakes and reservoirs. This Operational Statement applies to selective removal of vegetation along the right-of-way to provide for installation and safe operation of overhead lines, and passage of equipment and materials across the water body.

Although fish habitat occurs throughout a water system, it is the riparian habitat that is most sensitive to overhead line construction. Riparian vegetation occurs adjacent to the watercourse and directly contributes to fish habitat by providing shade, cover, and spawning and food production areas. It is important to design and build your overhead line project to meet your needs while also protecting riparian areas. Potential impacts to fish and fish habitat include excessive loss of riparian vegetation, erosion and sedimentation resulting from bank disturbance and loss of plant root systems, rutting and compaction of stream substrate at crossing sites, and disruption of sensitive fish life stages.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your overhead line project without a DFO review when you meet the following conditions:

- it does not require the construction or placement of any temporary or permanent structures (e.g. islands, poles, crib works, etc.) below the ordinary high water mark (HWM) (see definition below), and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Constructing Overhead Lines* listed below in this Operational Statement.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case,

you should contact your Conservation Authority, or the DFO office in your area (see Ontario DFO office list) or Parks Canada if the project is located within its jurisdiction, including the Trent-Severn Waterway and the Rideau Canal, if you wish to obtain an opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

**You are required to respect all municipal, provincial or federal legislation that applies to the work being carried out in relation to this Operational Statement.** The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* ([www.sararegistry.gc.ca](http://www.sararegistry.gc.ca)). If you have questions regarding this Operational Statement, please contact one of the agencies listed above.

We ask that you notify DFO, preferably 10 working days before starting your work by filling out and sending the Ontario Operational Statement notification form ([www.dfo-mpo.gc.ca/regions/central/habitat/os-ao/prov-terr/index\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/habitat/os-ao/prov-terr/index_e.htm)) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

## Measures to Protect Fish and Fish Habitat when Constructing Overhead Lines

1. Installing overhead lines under frozen conditions is preferable in all situations. On wet terrains (e.g., bogs), lines should be installed under frozen conditions, where possible, or using aerial methods (i.e., helicopter).
2. Design and construct approaches so that they are perpendicular to the watercourse wherever possible to minimize loss or disturbance to riparian vegetation.
3. Avoid building structures on meander bends, braided streams, alluvial fans, active floodplains or any other area that is inherently unstable and may result in erosion and scouring of the stream bed or overhead line structures.
  - 3.1. Wherever possible, locate all temporary or permanent structures, such as poles, sufficiently above the HWM to prevent erosion.
4. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to accommodate the overhead line. This removal

should be kept to a minimum and within the road or utility right-of-way.

5. Machinery fording the watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and should occur only if an existing crossing at another location is not available or practical to use. A *Temporary Stream Crossing Operational Statement* is also available.

5.1. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads) should be used provided they do not constrict flows or block fish passage.

5.2. Grading of the stream banks for the approaches should not occur.

5.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation is likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.

5.4. Time the one-time fording to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see the *Ontario In-Water Construction Timing Windows*).

5.5. Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.

6. Operate machinery on land and in a manner that minimizes disturbance to the banks of the watercourse.

6.1. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.

6.2. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent any deleterious substance from entering the water.

6.3. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.

6.4. Restore banks to original condition if any disturbance occurs.

7. Install effective sediment and erosion control measures before starting work to prevent entry of sediment into the watercourse. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.

7.1. Avoid work during wet, rainy conditions or use alternative techniques such as aerial methods (i.e., helicopter) to install overhead lines.

8. Stabilize any waste materials removed from the work site to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with grass or shrubs.

9. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g.,

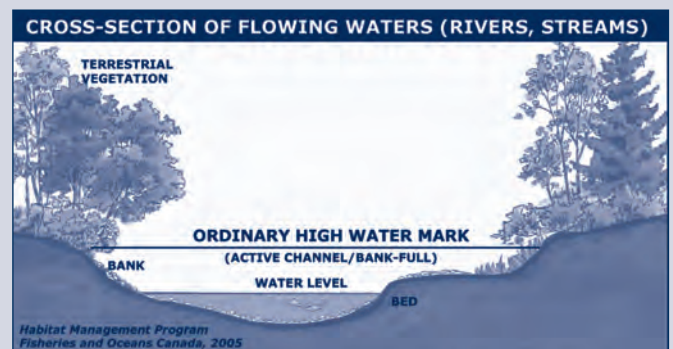
cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.

9.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

#### Definition:

**Ordinary high water mark (HWM)** – The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “active channel/bank-full level” which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).

For the Great Lakes this refers to the 80th percentile elevation above chart datum as described in DFO’s *Fish Habitat and Determining the High Water Mark on Lakes*.



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## FISHERIES AND OCEANS CANADA OFFICES IN ONTARIO

### Southern Ontario District

#### **Burlington**

Fisheries and Oceans Canada  
3027 Harvester Road, Suite 304  
P.O. Box 85060  
Burlington, ON L7R 4K3  
Telephone: (905) 639-0188  
Fax: (905) 639-3549  
Email: ReferralsBurlington@DFO-MPO.GC.CA

#### **London**

Fisheries and Oceans Canada  
73 Meg Drive  
London, ON N6E 2V2  
Telephone: (519) 668-2722  
Fax: (519) 668-1772  
Email: ReferralsLondon@DFO-MPO.GC.CA

### Eastern Ontario District

#### **Peterborough**

Fisheries and Oceans Canada  
501 Towerhill Road, Unit 102  
Peterborough, ON K9H 7S3  
Telephone: (705) 750-0269  
Fax: (705) 750-4016  
Email: ReferralsPeterborough@DFO-MPO.GC.CA

#### **Prescott**

Fisheries and Oceans Canada  
401 King Street West  
Prescott, ON K0E 1T0  
Telephone: (613) 925-2865  
Fax: (613) 925-2245  
Email: ReferralsPrescott@DFO-MPO.GC.CA

### Northern Ontario District

#### **Parry Sound**

Fisheries and Oceans Canada  
28 Waubeek Street  
Parry Sound, ON P2A 1B9  
Telephone: (705) 746-2196  
Fax: (705) 746-4820  
Email: ReferralsParrySound@DFO-MPO.GC.CA

#### **Sudbury and Sault Ste. Marie**

Fisheries and Oceans Canada  
1500 Paris Street, Unit 11  
Sudbury, ON P3E 3B8  
Telephone: (705) 522-2816  
Fax: (705) 522-6421  
Email: ReferralsSudbury@DFO-MPO.GC.CA

#### **Thunder Bay and Kenora**

Fisheries and Oceans Canada  
Thunder Bay Office  
100 Main Street, Suite 425  
Thunder Bay, ON P7B 6R9  
Telephone: (807) 346-8118  
Fax: (807) 346-8545  
Email: ReferralsThunderBay@DFO-MPO.GC.CA

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# ISOLATED OR DRY OPEN-CUT STREAM CROSSINGS

Fisheries and Oceans Canada  
Ontario Operational Statement

Version 1.0

For the purpose of this Operational Statement, the term “Isolated Crossing” means a temporary stream crossing technique that allows work (e.g., trenched pipeline or cable installation) to be carried out “in-the-dry” while diverting the natural flow around the site during construction. These types of open trenched crossings are isolated using flume or dam and pump techniques (see *Pipeline Associated Watercrossings*, 2005 at [http://www.capp.ca/default.asp?V\\_DOC\\_ID=763&PubID=96717](http://www.capp.ca/default.asp?V_DOC_ID=763&PubID=96717)).

The term “Dry Open-cut Stream Crossing” means a temporary stream crossing work (e.g., trenched pipeline or cable installation) that is carried out during a period when the entire stream width is seasonally dry or is frozen to the bottom.

The risks to fish and fish habitat associated with isolated open cut stream crossings include the potential for direct damage to substrates, release of excessive sediments, loss of riparian habitat, stranding of fish in dewatered areas, impingement/entrainment of fish at pump intakes, and disruption of essential fish movement patterns. Similarly, dry open-cut stream crossings pose a risk to fish and fish habitat due to potential harmful alteration of substrates, loss of riparian habitat, and release of excessive sediment once stream flows resume.

The order of preference for carrying out a cable or pipeline stream crossing, in order to protect fish and fish habitat, is: a) punch or bore crossing (see *Punch & Bore Crossings* Operational Statement); b) high-pressure directional drill crossing (see *High-Pressure Directional Drilling* Operational Statement); c) dry open-cut crossing; and d) isolated open-cut crossing. This order must be balanced with practical considerations at the site.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your isolated or dry open-cut stream crossing project without a DFO review when you meet the following conditions:

- if working within the Thames River, Sydenham River, Ausable River, Grand River, or Maitland River, you have contacted your Conservation Authority or local DFO Office (see Ontario

DFO office list) to ensure that your project will not impact Schedule I mussel species at risk under the federal *Species at Risk Act* (SARA), before proceeding,

- for dry, open-cut crossings the watercourse is dry or frozen completely to the bottom at the site,
- for isolated crossings, the channel width of the watercourse at the crossing site is less than 5 meters from ordinary high water mark to ordinary high water mark (HWM) (see definition below),
- the isolated crossing does not involve the construction or use of an off-stream diversion channel, or the use of earthen dams,
- the isolated crossing ensures that all natural upstream flows are conveyed downstream during construction, with no change in quality or quantity,
- the site does not occur at a stream location involving known fish spawning habitat, particularly if it is dependent on groundwater upwelling,
- the use of explosives is not required to complete the crossing, and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Carrying Out an Isolated or Dry Open-cut Stream Crossing* listed below.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact your Conservation Authority, or the DFO office in your area (see Ontario DFO office list) or Parks Canada if the project is located within its jurisdiction, including the Trent-Severn Waterway and the Rideau Canal, if you wish to obtain an opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

**You are required to respect all municipal, provincial and federal legislation that applies to the work being carried out in relation to this Operational Statement.** The activities undertaken in this Operational Statement must also comply with SARA ([www.sararegistry.gc.ca](http://www.sararegistry.gc.ca)). If you have questions regarding this Operational Statement, please contact one of the agencies listed above.

We ask that you notify DFO, preferably 10 working days before starting your work, by filling out and sending the Ontario Operational Statement notification form ([www.dfo-mpo.gc.ca/regions/central/habitat/os-ao/prov-terr/index\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/habitat/os-ao/prov-terr/index_e.htm)) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

## Measures to Protect Fish and Fish Habitat when Carrying Out an Isolated or Dry Open-Cut Stream Crossing

1. Use existing trails, roads or cut lines wherever possible, as access routes to avoid disturbance to the riparian vegetation.
2. Locate crossings at straight sections of the stream, perpendicular to the banks, whenever possible. Avoid crossing on meander bends, braided streams, alluvial fans, active floodplains or any other area that is inherently unstable and may result in the erosion and scouring of the stream bed.
3. Complete the crossing in a manner that minimizes the duration of instream work.
4. Construction should be avoided during unusually wet, rainy or winter thaw conditions.
5. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to access the construction site. This removal should be kept to a minimum and within the utility right-of-way.
6. Machinery fording a flowing watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and is to occur only if an existing crossing at another location is not available or practical to use. Operational Statements are also available for *Ice Bridges and Snow Fills*, *Clear-Span Bridges*, and *Temporary Stream Crossing*.
  - 6.1. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads) should be used provided they do not constrict flows or block fish passage.
  - 6.2. Grading of the stream banks for the approaches should not occur.
  - 6.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation is likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.
  - 6.4. Time the one-time fording to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see the *Ontario In-Water Construction Timing Windows*).
  - 6.5. Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.
7. Operate machinery in a manner that minimizes disturbance to the watercourse bed and banks.
  - 7.1. Protect entrances at machinery access points (e.g., using swamp mats) and establish single site entry and exit.
  - 7.2. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.

- 7.3. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent deleterious substances from entering the water.
- 7.4. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.

8. Install effective sediment and erosion control measures before starting work to prevent entry of sediment into the watercourse. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.
9. Stabilize any waste materials removed from the work site, above the HWM, to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with grass or shrubs.
10. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent soil erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
  - 10.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

## Measures to Protect Fish and Fish Habitat when Carrying Out an Isolated Crossing

Temporary isolation is used to allow work “in-the-dry” while maintaining the natural downstream flow by installing dams up and downstream of the site and conveying all of the natural upstream flow into a flume, or pumping it around the isolated area. In addition to measures 1 to 10, the following measures should be carried out when conducting an isolated stream crossing:

11. Time isolated crossings to protect sensitive fish life stages by adhering to fisheries timing windows (see Measure 6.4).
12. Use dams made of non-earthen material, such as water-inflated portable dams, pea gravel bags, concrete blocks, steel or wood wall, clean rock, sheet pile or other appropriate designs, to separate the dewatered work site from flowing water.
  - 12.1. If granular material is used to build dams, use clean or washed material that is adequately sized (i.e., moderately sized rock and not sand or gravel) to withstand anticipated flows during the construction. If necessary, line the outside face of dams with heavy poly-plastic to make them impermeable to water. Material to build these dams should not be taken from below the HWM of any water body.
  - 12.2. Design dams to accommodate any expected high flows of the watercourse during the construction period.

13. Before dewatering, rescue any fish from within the isolated area and return them safely immediately downstream of the worksite.

13.1. You will require a permit from DFO to relocate any aquatic species that are listed as either endangered or threatened under SARA. Please contact your Conservation Authority or the DFO office in your area to determine if an aquatic species at risk is in the vicinity of your project and, if appropriate, use the DFO website at [www.dfo-mpo.gc.ca/species-especies/permits/sarapermits\\_e.asp](http://www.dfo-mpo.gc.ca/species-especies/permits/sarapermits_e.asp) to apply for a permit.

14. Pump sediment laden dewatering discharge into a vegetated area or settling basin, and prevent sediment and other deleterious substances from entering any water body.

15. Remove accumulated sediment and excess spoil from the isolated area before removing dams.

16. Stabilize the **streambed** and restore the original channel shape, bottom gradient and substrate to pre-construction condition before removing dams.

17. Ensure **banks** are stabilized, restored to original shape, adequately protected from erosion and re-vegetated, preferably with native species.

18. If rock is used to stabilize banks, it should be clean, free of fine materials, and of sufficient size to resist displacement during peak flood events. The rock should be placed at the original stream bank grade to ensure there is no infilling or narrowing of the watercourse.

19. Gradually remove the downstream dam first, to equalize water levels inside and outside of the isolated area and to allow suspended sediments to settle.

20. During the final removal of dams, restore the original channel shape, bottom gradient and substrate at these locations.

#### 21. Pumped Diversion

Pumped diversions are used to divert water around the isolated area to maintain natural downstream flows and prevent upstream ponding.

21.1. Ensure intakes are operated in a manner that prevents streambed disturbance and fish mortality. Guidelines to determine the appropriate mesh size for intake screens may be obtained from DFO (e.g., *Freshwater Intake End-of-Pipe Fish Screen Guideline* (1995), available at [www.dfo-mpo.gc.ca/Library/223669.pdf](http://www.dfo-mpo.gc.ca/Library/223669.pdf)).

21.2. Ensure the pumping system is sized to accommodate any expected high flows of the watercourse during the construction period. Pumps should be monitored at all times, and back-up pumps should be readily available on-site in case of pump failure.

21.3. Protect pump discharge area(s) to prevent erosion and the release of suspended sediments downstream, and remove this material when the works have been completed.

## Measures to Protect Fish and Fish Habitat when Carrying Out a Dry Open-Cut Stream Crossing

In addition to measures 1 to 10, the following measures should be carried out when conducting a dry open-cut stream crossing:

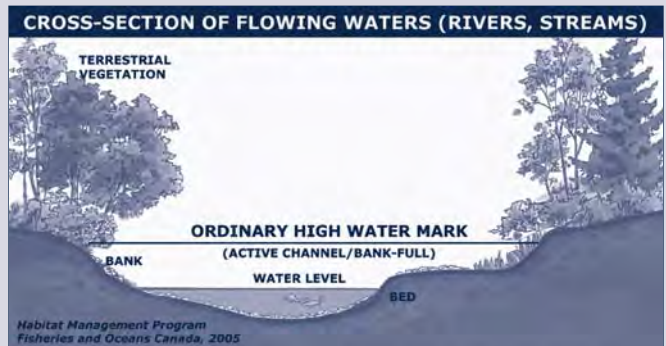
22. Stabilize the **streambed** and restore the original channel shape, bottom gradient and substrate to pre-construction condition.

23. Ensure **banks** are stabilized, restored to original shape, adequately protected from erosion and re-vegetated, preferably with native species.

#### Definition:

**Ordinary high water mark (HWM)** - The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the "active channel/bank-full level" which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).

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## FISHERIES AND OCEANS CANADA OFFICES IN ONTARIO

### Southern Ontario District

#### **Burlington**

Fisheries and Oceans Canada  
3027 Harvester Road, Suite 304  
P.O. Box 85060  
Burlington, ON L7R 4K3  
Telephone: (905) 639-0188  
Fax: (905) 639-3549  
Email: ReferralsBurlington@DFO-MPO.GC.CA

#### **London**

Fisheries and Oceans Canada  
73 Meg Drive  
London, ON N6E 2V2  
Telephone: (519) 668-2722  
Fax: (519) 668-1772  
Email: ReferralsLondon@DFO-MPO.GC.CA

### Eastern Ontario District

#### **Peterborough**

Fisheries and Oceans Canada  
501 Towerhill Road, Unit 102  
Peterborough, ON K9H 7S3  
Telephone: (705) 750-0269  
Fax: (705) 750-4016  
Email: ReferralsPeterborough@DFO-MPO.GC.CA

#### **Prescott**

Fisheries and Oceans Canada  
401 King Street West  
Prescott, ON K0E 1T0  
Telephone: (613) 925-2865  
Fax: (613) 925-2245  
Email: ReferralsPrescott@DFO-MPO.GC.CA

### Northern Ontario District

#### **Parry Sound**

Fisheries and Oceans Canada  
28 Waubeek Street  
Parry Sound, ON P2A 1B9  
Telephone: (705) 746-2196  
Fax: (705) 746-4820  
Email: ReferralsParrySound@DFO-MPO.GC.CA

#### **Sudbury and Sault Ste. Marie**

Fisheries and Oceans Canada  
1500 Paris Street, Unit 11  
Sudbury, ON P3E 3B8  
Telephone: (705) 522-2816  
Fax: (705) 522-6421  
Email: ReferralsSudbury@DFO-MPO.GC.CA

#### **Thunder Bay and Kenora**

Fisheries and Oceans Canada  
Thunder Bay Office  
100 Main Street, Suite 425  
Thunder Bay, ON P7B 6R9  
Telephone: (807) 346-8118  
Fax: (807) 346-8545  
Email: ReferralsThunderBay@DFO-MPO.GC.CA

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